RED EPIC®

OPERATION GUIDE

BUILD V3.2

EPIC-M & EPIC-X

WWW.RED.COM

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EPIC-M / EPIC-X

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COMPLIANCE

INDUSTRIAL CANADA EMISSION COMPLIANCE STATEMENTS

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENT

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

NOTE: This device complies with Part 15 of the FCC Rules.

Operations subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable interference.

CAUTION: If the device is changed or modified without permission from RED, the user may void his or her authority to operate the equipment.

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AUSTRALIA AND NEW ZEALAND STATEMENT

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to EN 55022:2006

JAPAN STATEMENTS

This is a Class B product based on the standard of the Voluntary Control Council for Interference (VCCI) for information technology equipment. If this equipment is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づく クラス B 情報技術装置です。この装置は家庭環境で使用することを目的としていますが、ラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをしてください。

EUROPEAN UNION COMPLIANCE STATEMENTS

RED declares that the equipment described in this document is in conformance with the requirements of the European Council EMC Directive 2004/108/EC, Low Voltage Directive 2006/95/EC, RoHS Directive 2002/95/EC and WEEE Directive 2002/96/EC.

This declaration is based upon compliance of the product to the following standards:

- EN 55022, Information Technology Equipment - Radio Disturbance Characteristics
- EN 55024, Information Technology Equipment - Immunity Characteristics
- EN 61000-3-2, Limits for harmonic current emissions
- EN 61000-3-3, Limits for harmonic current emissions
- EN 60950-1, Information Technology Equipment – Safety

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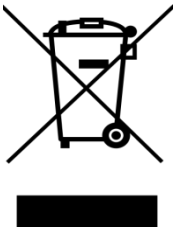

The Waste Electrical and Electronic Equipment (WEEE) mark applies only to countries within the European Union (EU) and Norway. This symbol on the product and accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product to designated collection points where it will be accepted free of charge. Alternatively, in some countries you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point. Penalties may be applicable for incorrect disposal of this waste, in accordance with you national legislation.

For business users in the European Union, if you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Responsible party:

Red Digital Cinema®
34 Parker
Irvine, CA 92618
USA

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BEFORE YOU START

Congratulations on your purchase of a RED DSMC® Digital Still and Motion Camera.

Please read the attached safety instructions, and only then unpack the camera body and any accessories. If there is any physical damage or missing components for either your camera body or any accessories, please file a support ticket at **www.RED.com/support**.

RED EPIC Digital Still and Motion Camera

IMPORTANT SAFETY INSTRUCTIONS

READ BEFORE USING YOUR CAMERA

A. Heed all cautions and warnings in these instructions.

B. Read these instructions before operating the camera and accessories.

C. Follow these instructions while operating the camera and accessories.

D. Keep these instructions with the camera and accessories at all times.

E. DO NOT attempt to modify, dismantle or open your camera, lens or other accessory as doing so may expose you to electric shock and serious injury. There are no user-serviceable parts inside. Alteration or repairs made to the camera, lens or other accessory, except by a RED authorized service facility, will void the Limited Warranty. Users are not permitted to make design changes or otherwise modify the operation of the camera, lenses or other accessories, without the express written approval of RED DIGITAL CINEMA.

F. Only use attachments/accessories specified by RED.

G. Install camera and accessories in accordance with the manufacturer's instructions.

H. Avoid imaging of laser beams as they may cause damage to the sensor.

I. DO NOT use the camera or accessories near water. Avoid exposing your camera to moisture. The unit is not waterproof, so contact with water could cause permanent damage to the unit as well as electric

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shock and serious injury to the user. DO NOT use the camera in the rain or under other conditions with high moisture without appropriate protection, and immediately remove power source if camera or accessories are exposed to moisture.

WARNING: To reduce the risk of fire or electric shock, do not expose the camera or accessories to rain or moisture.

J. DO NOT expose your camera to excessive vibration or impact (shock). Be careful not to drop your camera. Internal mechanisms may be damaged by severe shock. Mechanical alignment of optical elements may be affected by excessive vibration.

K. **ELECTROMAGNETIC INTERFERENCE:** The use of devices using radio or other communication waves may result in the malfunction or interference with the unit and/or with audio and video signals.

L. Clean only using a dry cloth. When cleaning your camera, remember that it is not waterproof and moisture can damage electronic circuitry. DO NOT rinse or immerse any element of the camera, lens or other accessory, keep them dry at all times. DO NOT use soaps, detergents, ammonia, alkaline cleaners, and abrasive cleaning compounds or solvents. These substances may damage lens coatings and electronic circuitry.

M. Maintain sufficient ventilation - DO NOT block any ventilation openings or obstruct cooling fan airflow.

CAUTION: Proper camera ventilation requires a minimum 1/2" (1,25cm) clearance between the camera ventilation openings and external surfaces. Verify that objects that can block the fan intake and exhaust ports do not impede airflow. Failure to permit adequate airflow may result in overheating of the camera, degraded operation and in extreme situations, damage to the camera.

N. DO NOT operate or store near any heat sources such as radiators, heat registers, stoves, or any other apparatus that produce heat. Store in a protected, level and ventilated place. Avoid exposure to temperature extremes, damp, severe vibration, strong magnetic fields, direct sunlight or local heat sources during storage. Remove any batteries from the camera before storage. Recommended storage and usage temperatures for your camera, lenses and other accessories are:

   a. Operating range: 0°C to +40°C (32°F to 104°F)

   o Storage range: -20°C to +50°C (-4°F to 122°F)

   If there are any performance issues with your camera or accessories when operating within this temperature range, please file a support ticket on **www.RED.com/support**.

O. The Side Handle, Side SSD Module, Rear Modules and Lens Mount are **NOT HOT SWAPPABLE** – meaning you cannot remove or install them while the camera is powered on. Before installing or removing any of these accessories, you MUST power down the camera. Failure to do so may result in damage to the accessory and / or camera brain that will not be covered under warranty.

P. Do not bypass the third prong of the grounding-type plug on the power cord of the AC Power Adapter. A grounding-type plug has two blades and a third "grounding" prong. The third prong is provided for your safety. A grounding-type plug shall be connected to an outlet with a protective earthen connection. If the grounding-type plug does not fit into your outlet, do not attempt to modify the plug or outlet, consult a qualified electrician.

Q. Protect all power cords from being pinched, walked on or driven over by a vehicle. Replace any power cords suspected of sustaining damage due to crushing or other forms physical damage.

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CAUTION: The power cord plug for the AC Power Adapter is used as the power disconnect. To disconnect all power from the AC Power Adapter, unplug the power cord plug from the wall outlet. During use, the power cord plug should remain easily accessible at all times.

R. Lithium Ion batteries may be subject to special handling requirements pursuant to federal and local laws. Please refer to specific shipping instructions included with your battery regarding proper transport of your battery. Do not handle your battery if it is damaged or leaking. Disposal of batteries must be in accordance with local environmental regulations. For example, California law requires that all rechargeable batteries must be recycled by an authorized recycle center. Storing batteries fully charged or in high temperature, conditions may permanently reduce the life of the battery. Available battery capacity may also be temporarily lessened after storage in low temperature conditions.

WARNING: Do not expose the battery to excessive heat.

WARNING: Danger of explosion if an incorrect battery is charged with the RED Charger or is used to power the camera and accessories. Replace only with the same or equivalent type battery.

CAUTION: Refer all service and repair to qualified RED service personnel. To reduce the risk of electric shock, and damage to the camera or accessories, DO NOT attempt to perform any servicing other than any procedures that are recommended in the operating instructions.

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THEORY OF OPERATION

The RED family of Digital Still and Motion Cameras (DSMC) provide high performance digital imaging over a wide range of frame rates and optical formats including Super 35mm / APS-H. The RED DSMC camera is supplied as standard with a PL mount, and may be configured with mounts and 19 mm rods to accommodate most cinematography lenses, matte boxes and follow focus systems. Adaptors for 15mm offset studio and 15mm lightweight rods are also available.

In addition to compatibility with the majority of existing PL mount cinematography lenses; a select range of Super 35mm PL mount prime and zoom lenses are available from RED.

Other lens mounts, including the DSMC Canon mount are available, permitting the use of Canon EF and EF-S photographic lenses. The Canon mount can report lens iris, focus and zoom data when mated to an appropriate lens. In addition, iris and manual or auto-focus settings may be controlled from the camera.

Lens mounts may be exchanged in the field, however it is highly recommended that this be performed in a dust-free environment, as the optical path will be exposed to the elements during this process.

A B4 mount to PL mount adaptor is also available to permit use of 2/3" HD broadcast lenses on the RED DSMC camera. The optical coverage it provides is approximately equivalent to 16mm, hence the maximum recording resolution operating with a B4 mount 2/3" lens is 2K (2048 x 1152 pixels) progressive scan.

MYSTERIUM X® SENSOR

The MYSTERIUM X sensor has been specifically designed for use with the RED DSMC camera, and provides variable frame rate imaging at up to 120fps at 5K resolution, and up to 240 fps at 2K resolution.

Native color balance for the MYSTERIUM X sensor is 5,000 KELVIN, but it may be electronically compensated for any color temperature in the range 1,700 to 10,000 KELVIN. White balance preset values include Tungsten (3200K) and Daylight (5600K) light sources. The camera may also calculate a color neutralizing White Balance value on demand by imaging on a standard white or 18% grey card.

The MYSTERIUM X sensor includes high precision analog to digital conversion, capable of delivering up to 13.5 stops of dynamic range with daylight light sources over a camera sensitivity rating of 320-800 ISO. In HDR mode, dynamic range can be extended to approximately 18 stops.

IMAGE PROCESSING

The digital image received from the sensor is formatted as a pixel defect corrected (but in all other aspects unprocessed) 12-bit, 14-bit or 16-bit per pixel RAW data frame. When operating in STILLS mode, each image received from the sensor is treated as a unique FRAME; however when operating in MOVIE mode, successive images received from the sensor are collected together into a CLIP. In all other regards, a frame of information gathered in STILLS mode or MOVIE mode is identical.

Each RAW frame or sequence of RAW frames in a clip is compressed using proprietary wavelet based REDCODE® RAW compression, then stored to a digital media Magazine such as REDMAG™ 1.8" SSD.

When recorded, the RAW data is independent of any RGB domain color processing such as ISO, White Balance or other RGB color space adjustments made by the camera operator. These parameters are saved with the RAW data as reference METADATA; i.e. color is not burned into the recorded RAW data.

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This recording technique permits RGB color processing choices to be deferred to post-production or to be adjusted in the field to help a director visualize alternative color treatments, without affecting the recorded RAW data's image quality or dynamic range.

The camera's monitoring path converts RAW sensor data to a white balanced 12-bit depth 2048 x 1080 pixel RGB 4:4:4 video signal. This signal may be modified using ISO, White Balance or other RGB color space adjustments as desired by the operator, and is then scaled and gamma corrected to provide VIEWFINDER, HD-SDI and HDMI monitor outputs at 10-bit depth in 4:2:2 YCC or 8-bit depth in 4:4:4 RGB.

Frame guides and other camera data may be added as desired by the user to one or more of the outputs.

NOTE: The supplied REDCINE-X® PRO application software can create and export .RMD "color look" files which may then be imported as camera monitor path color processing PRESETs. This information is stored as reference metadata, so that this color processing choice can be the default value used in Post-production. Refer to SECONDARY MENUS > PRESETS for details how to import and apply .RMD file metadata.

HDRX™

HDRx is an option for extending dynamic range up to 6 stops over the base Dynamic Range offered by the camera. When enabled HDRx simultaneously shoots two images of identical resolution and frame rate - a normally exposed primary track (A-track), and an underexposed secondary track (X-track) whose exposure value reflects the additional stops of highlight protection desired.

i.e. if you select an HDR value of +2 and your primary track exposure is 1/48th sec, the secondary track exposure will be 2 stops under, or 1/192 sec. The ISO and Aperture remain the same for both exposures.

During acquisition and recording, the two tracks are "motion-conjoined", meaning there is no gap in time between the two exposures. This is very important to note because if they were traditional alternating exposures, there would be a time gap between the two tracks that would show up as an undesirable motion artifact. Both tracks (A & X) are stored in a single .R3D® file.

Since there are two exposures in HDRx mode, the camera is recording double the amount of frames each second. For example, when shooting at 24fps, the camera is recording two 24fps tracks, which is the data rate equivalent of 48fps; however after combining the A and X tracks in post-production you will see only one 24fps blended image sequence.

HDRx provides multiple options for exploitation in post-production.

- Blend the two tracks in post tools like REDCINE-X, Storm or any other application that supports the SDK to create Magic Motion™. This blending of the two tracks comes with a slider so you can decide just how much of each track you want to use. A preview window shows you the combined result of your selection, or you can view each track individually.
- Combine the two tracks using MNMB (More Normal Motion Blur). MNMB is designed to emulate the motion of a traditional camera with full motion blur. This is a tool created by The Foundry that uses a new motion estimation algorithm designed specifically for HDRx. The shorter exposure (sharper image) is blended to match the motion blur of the normal exposure. Again, a preview window shows the combined result of your selection, or you can view each track individually.
- Use the X-track data for motion tracking, then combine the X-track with the A-track, or just motion stabilize the A-track using the motion analysis data extracted from the X-track.

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- Exporting to EXR file format will give you a multi-view EXR with both exposures (like a stereo EXR).

NOTE: If you ignore the X-track data, you will have a standard exposure with up to 13.5 stops of dynamic range just as if you had not enabled HDRx. For this reason, we encourage the A-track exposure to be "normal" as it provides the most options. If you are tempted to shoot "over-under", you are then fully committed to using HDRx and your post-production options are reduced.

NOTE: When recording in HDRx mode the camera records twice as many frames per second so the maximum frame rate or minimum REDCODE ratio, and the maximum record time on your media will be cut in half.

MAGIC MOTION™

Shooting at 24fps and with an 180 degree (1/48th) shutter on a film or digital camera may create an optical illusion we are familiar with, however it is not really the way the eye sees motion. To understand this, ask someone to stand in front of you and swing their arm over their head from one side to the other. What you would observe in the recording is a constant motion blur until the arm stopped. What your eye sees though is both motion blur AND a sharper reference to the arm and hand all along the motion path. "Magic Motion" provides such a combination of motion blur (A-track) and a sharper reference (X-track), with the bonus of extreme dynamic range not available with any other motion capture camera system.

AUDIO RECORDING

The RED DSMC camera can record up to two discreet channels of microphone level uncompressed 24-bit, 48 KHz audio (four channels of microphone level or line level audio inputs when equipped with a PRO I/O Module), that are synchronized with video and timecode to a REDMAG 1.8" SSD digital media Magazine.

Input signals are routed via a high quality pre-amplifier and soft clip analog limiter in order to achieve the desired audio reference / recording level and maximize dynamic range.

To assist with audio reference level setup, the camera provides a color-coded Audio Level Meter in the Graphical User Interface. Meter range is –36dBu to +20dBu (-56dBFS to 0dBFS) with audio input type, reference level and audio input clipping indicators.

Audio monitor output options include a 2-channel headphone output on the camera Brain and 2-channel line level analog outputs from the optional PRO I/O Module, plus 2-channel and 4-channel 24-bit 48KHz uncompressed digital audio embedded in the HD-SDI and HDMI outputs.

MICROPHONE LEVEL ANALOG INPUTS

The recording level of a Microphone input is affected by the sensitivity of the microphone and the Gain setting of the camera's pre-amplifier. Available pre-amplifier range is +8dB to +62dB, with a default value of +10dB. The camera operator should choose a Gain value that aligns the input signal to the 0dBu reference line drawn on the camera's Audio Level Meter (or the 0VU reference line if operating at that level).

This setting provides up to 30dB of input signal headroom above reference 0dBu level before clipping (up to 26dB above 0VU reference level) and maximizes the signal to noise ratio of the 24-bit digital recording.

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LINE LEVEL ANALOG INPUTS

The recording level of a Line input is affected only by the signal provided by the field production sound mixer or other external line level source. The sound mixer operator should choose a mixer output level that aligns a reference tone signal to the 0dBu (-20dBFS) reference mark drawn on the camera's Audio Level Meter, or if using 0VU as reference level, a mixer output level that aligns a reference tone signal to the 0VU (-16dBFS) reference mark.

This setting provides up to 24dB of input signal headroom above reference 0dBu level before clipping (up to 20dB above 0VU reference level) and maximizes the signal to noise ratio of the 24-bit digital recording.

VIDEO MONITORING OUTPUTS

In its default configuration, the RED DSMC camera can simultaneously support one VIEWFINDER output (suitable for use by a BOMB EVF®, or RED LCD) plus one PROGRAM output and one PREVIEW output (suitable for use by HDMI or HD-SDI monitors). The various monitor outputs can support a set of overlay graphics including camera GUI, timecode, clip name and framing guides; the specific overlay graphics for each type of output is user configurable.

The default VIEWFINDER output is the EVF / LCD connector located on the front face of the Side SSD Module. If neither of these is connected, the VIEWFINDER output can be transferred to either the HDMI output or the HD-SDI output of the camera Brain.

BOMB EVF

A 1280 x 784 pixel progressive scan color display providing the equivalent of viewing a 17" reference monitor from a distance of about 3ft (1m). Display includes Surround View™ look around area, frame guides and safe action / title, zebra and false color exposure overlays, operation status and setup menus.

RED LCD

An 800 x 480 pixel progressive scan color display supporting a touchscreen overlay. Display includes Surround View™ look around area, frame guides and safe action / title, zebra and false color exposure overlays, operation status and setup menus.

HD-SDI

A 720p or 1080p progressive scan output suitable for monitoring or recording to an external VTR or DDR device. May be configured for 10-bit LIN (VIDEO) or 10-bit LOG (FILM) encoded data.

HDMI

A 720p or 1080p progressive scan output suitable for monitoring via a PC monitor or most HDTV displays.

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Example of HDMI Monitor Output in MENUS mode.

RED LCD / BOMB EVF®

The optional RED LCD and BOMB EVF are specialized video monitors that provide the user with a variety of tools to assist framing, focus and exposure, including:

- Surround View™, which is an additional look around area, visible outside of the recorded image.
- Frame Guides, showing common film presentation and television aspects such as 2.40:1 and 16:9.
- Focus, aided by high display resolution, 1:1 Focus Check function and False Color overlay.
- Exposure, aided by dual Zebras, False Color overlay, RAW “Traffic Lights” and RGB histogram.
- System information including current frame rate, ISO rating, shutter speed, color temperature, record resolution, record quality, clip name, timecode value and the remaining battery and media capacity.

For applications where use of an attached RED EVF or RED LCD is not desired – for example when working on a crane – the VIEWFINDER / MENU output can be transferred to the HD-SDI or HDMI outputs, supporting remote camera monitoring up to 200 ft away.

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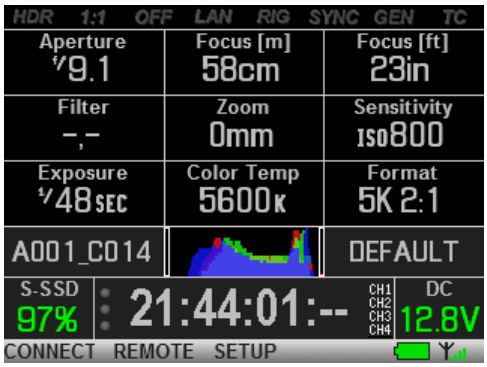
REDMOTE®

REDMOTE is a camera control unit for RED's family of DSMC cameras that attaches to the rear of the camera Brain or rearmost expansion module. REDMOTE may also be detached from the camera or rearmost module and provide wireless remote control of the camera over proprietary REDlink™ protocol.

Whether attached or operating via wireless, REDMOTE supports all controls necessary to operate the camera, including Record Start / Stop, Shutter Speed, White Balance, ISO and programmable User Keys. A color LCD displays critical camera parameters, including media and battery capacity, timecode and clip name, lens data and exposure information.



REDMOTE LCD display

REDMOTE includes a rechargeable Li-Ion battery, which automatically re-charges when attached to the camera or rearmost module. It may also be re-charged by connecting to a USB 2.0 based power source such as a laptop PC or cell phone charger. Under typical operating conditions, REDMOTE should operate for up to 8 hours without requiring a re-charge and support a wireless communication range of approximately 50 ft.

DIGITAL MAGAZINE (MEDIA)

REDCODE RAW compressed MOVIE clips and STILL images; time code, multi-channel audio and metadata may be recorded to **REDMAG 1.8" SSD** solid-state digital media Magazine of 64GB, 128GB or 256GB capacity.

Each MOVIE clip is recorded with a unique name in a Clip folder with the extension .RDC. This folder contains all appropriate information describing the clip, including one or more REDCODE RAW.R3D files and all color grading metadata and other system level metadata such as lens and location information. Refer to CLIP NAMING CONVENTIONS.

The individual Clip folders are placed into a Magazine folder (i.e. root directory) on the digital media. This Magazine folder has the extension .RDM. As this folder contains all the recorded Clips; copying all clips recorded on the SSD to other media may be performed by a drag and drop operation on the .RDM folder.

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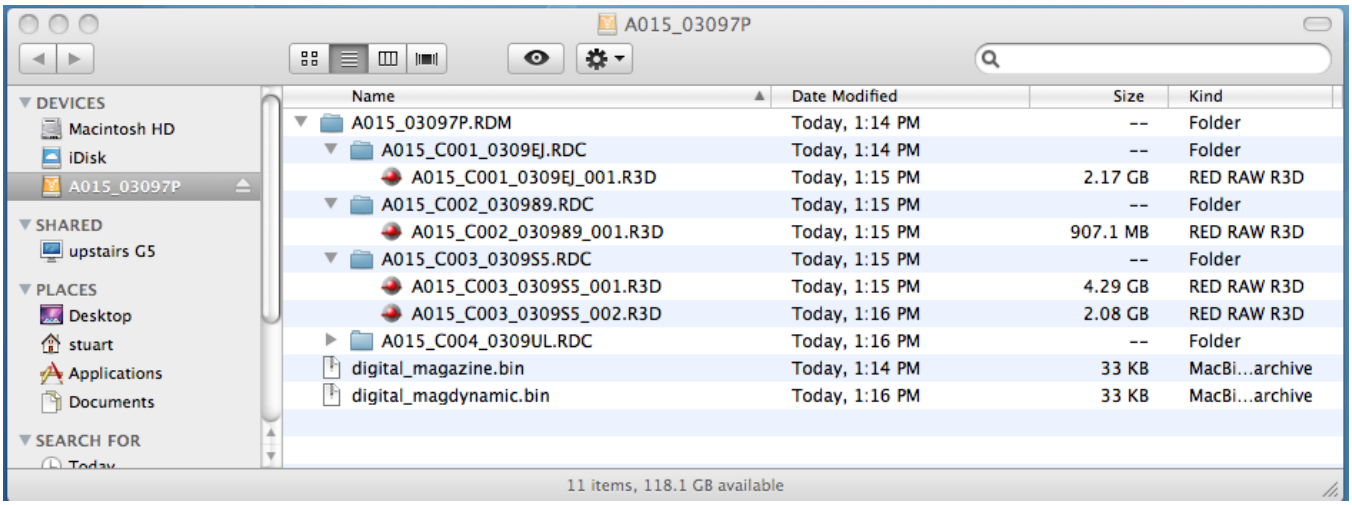

Typical Magazine Folder and clip structure

For additional information about digital magazines, refer to APPENDIX B: MANAGING DIGITAL MEDIA.

METADATA

RED's family of DSMC cameras record the Metadata, which is data for each frame of the recording:

- Clip Name
- Time Code
- Date and GMT
- Lens and shutter speed / angle parameters
- Audio configuration
- Firmware version #
- media serial #
- LTC user bits (3 32-bit word reg-dump from ISP)
- s4i static data
- s4i dynamic data
- GMT time/data
- RGB curves
- shadow control
- Luma curve
- Lens name, brand, ID, near focus, far focus
- Camera Network Name
- Production Name
- Director Name
- DP Name
- Copyright
- Unit
- Camera Name
- Location
- Scene
- Take
- Accelerometer Data
- Gyro Data

CLIP NAMING CONVENTIONS

When you press RECORD, the camera automatically creates a unique name for the CLIP being recorded to the REDMAG 1.8" SSD media. The format of this name is:

Camera Letter + Reel Number + Month + Day

e.g. A001_C002_0502**.RDC

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Where: A = camera A, 001 = reel 001, C002 = clip 002, and 0502 = May 02, and the digits * * are two random characters generated by the camera to prevent any possibility of duplicate names being created.

So a three Clip sequence of Clip Folders within a Magazine Folder on Camera A would look like this:

A001_C001_0502**.RDC A001_C002_0502**.RDC A001_C003_0502**.RDC

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MULTI CAMERA SHOOTS

The scheme provides flexibility to uniquely identify Clips from different cameras on a multi-camera shoot.

For example three cameras, slated as camera A, camera B, and camera C respectively, can generate these easily recognizable clips on their respective digital media Magazines.

A001_C001_0502**.RDC B001_C001_0502**.RDC C001_C001_0502**.RDC

3D (STEREO) CAMERA SHOOTS

The scheme also allows unique identification of Clips from left and right eye cameras on a stereo shoot.

For example two cameras, both slated as Camera S, can generate these easily recognizable clips on their respective digital media Magazines.

S001_L001_0502**.RDC S001_R001_0502**.RDC

For more information refer to APPENDIX F: 3D SETUP / OPERATION > CLIP NAMING CONVENTIONS.

SMPTE TIMECODE

Time Code (TC) is a SMPTE timecode track that synchronizes to the camera's high precision internal clock, or if operated in Jam Sync mode, references to an externally supplied SMPTE master timecode signal. TC is a sequential code that is continuous from frame to frame, but is discontinuous from clip to clip.

Edge Code (EC) is a SMPTE timecode track that always starts at 1.00.00.00 on the first frame recorded to the digital media. It is a sequential code that is continuous from frame to frame and also continuous from clip to clip. EC is equivalent to RUN RECORD commonly found on broadcast cameras.

Irrespective of the timecode mode selected, once recording starts the camera's timecode counter will update at the same instantaneous frame rate as the recording. This ensures that a valid SMPTE timecode value is created for every frame in the clip, eliminating any timecode count jumps that could affect playback or editing.

If operating in Jam Sync mode referenced to an external timecode source, the clip's master time reference point is the first frame of the recorded clip.

NOTE: When in Loop Record mode, Edge Code will also become discontinuous from clip to clip, because frames copied into the cache memory are discarded. This may lead to editing difficulties with post-production applications that assume continuous timecode.

POWER CONSUMPTION

The camera draws approximately 60 watts when recording in 4K resolution, 24fps MOVIE mode. The camera is cooled by convection from the camera body assisted by a fan contained in a sealed air duct.

Under typical operating conditions, a REDVOLT® battery will run the camera and accessories for about 30 minutes and a REDVOLT® XL battery will run the camera and accessories for about 90 minutes.

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CAMERA OPERATIONAL CONTROLS

This section describes the available operational controls on the RED DSMC camera Brain, Side SSD Module, Side Handle and REDMOTE accessories.

BRAIN

A	Power Status LED
B	Power / Record Button
C	Record Status LED

Power / Record Button / Status LEDs

- **Power / Record Button:** Powers camera Up / Down and initiates Record Stop / Start
- **Power Status LED:** Indicates Power status:
  - LED Red = Power Present, Camera OFF
  - LED Yellow = Power present, Camera Booting
  - LED Green = Power present, Camera ON
  - LED Green Blinking = Power present. Running on Battery
  - LED Yellow Blinking = Power present. 5-10 minutes of Battery time left

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- LED Red Blinking = Power present. Less than 5 minutes of Battery time left

- **Record Status LED:** Indicates record status:
  - LED Off = No Media present.
  - LED Green = Ready to Record
  - LED Red Constant = Recording
  - LED Red Slow Blink = Recording, 25% Media Left
  - LED Red Fast Blink = Recording, 5% Media Left
  - LED Yellow = Finalizing
- **Both LEDs:** Indicates camera status:
  - Both LEDs Green Blink = firmware update in Progress

SIDE SSD MODULE

A	SSD Slot
B	User Key 1
C	User Key 2
D	Focus / Record Button
E	Media Indicator

Side SSD Module Controls

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- **SSD Slot:** Slot for REDMAG 1.8” SSD digital media Magazine.
- **User Key 1:** Initiates user defined camera function. Undefined by Default.
- **User Key 2:** Initiates user defined camera function. Undefined by Default.
- **User Key 1 + User Key 2 :** Press both keys to Eject (unmount) REDMAG 1.8” SSD Magazine.
- **Focus / Record Button:** Touch for Auto Focus, fully depress to Start or Stop Record.
- **Media Indicator LED:** Indicates status of media:
  - LED Off = No Media
  - LED Green = Ready to Record
  - LED Red Constant = Recording
  - LED Red Slow Blink = Recording, 25% Media Left
  - LED Red Fast Blink = Recording, 5% Media Left
  - LED Yellow = Finalizing
  - LED Yellow Blinking = Media Access (Format etc...)

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SIDE HANDLE

TOP

A	Battery Release	**D**	LCD Menu Keys
B	Focus / Record Button	**E**	LCD Display
C	Adjustment Ring	**F**	LCD Backlight Button

RED Side Handle Controls - Top

- **Battery Door Release Button:** Releases Side Handle battery door to permit battery exchange.
- **Focus / Record Button:** Touch for Auto Focus, fully depress to Start or Stop Record.
- **Adjustment Ring:** Selects and adjusts camera parameter values. Similar to the scroll wheel on the navigation group.
- **LCD Menu Keys:** The specific functions for each key are defined by the LCD screen. Defaults are:

1 – ISO 2 – F-Stop 3 – Shutter Speed 4 – White Balance

- **LCD Display:** Displays key camera parameter values.
- **LCD Backlight Button:** Enables LCD backlight.

Note: Side Handle controls can be locked/unlocked by holding the 1 and 4 buttons simultaneously.

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FRONT

A	Stills / Movie Slider

Side Handle Controls - Front

- **Stills / Movie Slider:** Selects between STILLS and MOVIE modes of operation.

NOTE: This switch is not active at this time. Default camera operation is MOVIE

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REAR

RED Side Handle Controls - Rear

A	MENU Button	**D**	User Keys A-D
B	Rocker Switch	**E**	System Keys 1- 3
C	Navigation Group	**F**	Thumbwheel Lock

- **Menu Button:** Press to access / camera setup menus.
- **Rocker Switch:** Increases or decreases selected value based on parameter selected in USER KEYs.

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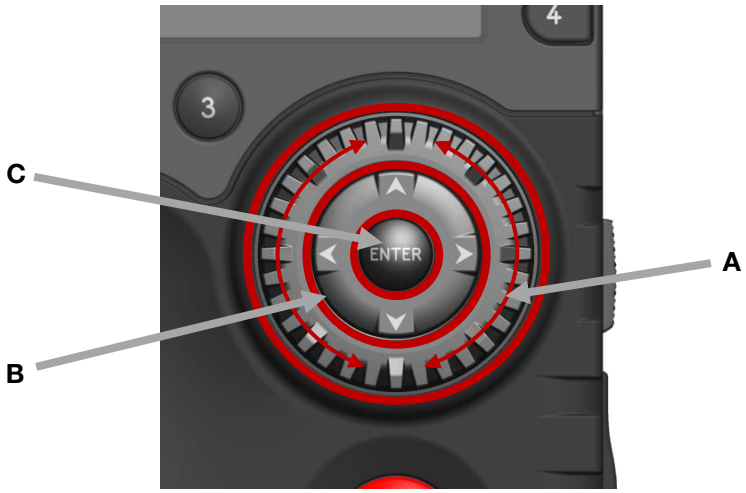
- **Navigation Group:** Allows navigation through camera menus, selection of camera parameter for adjustment, and adjustment of selected camera parameter.



Side Handle Navigation Group

A	Scroll Wheel	**B**	Direction Keys	**C**	Enter Button

  - **Scroll Wheel:** Selects and adjusts camera parameter value.
  - **Direction Keys:** Navigates camera menus and may select parameter for adjustment.
  - **Enter Button:** Confirms selected parameter value adjustment.

- **User Keys:** User Function Keys A-D. The specific function of these keys may be programmed by the user. Default settings for User Function Keys A-D are as follow:
  - User Key A – Toggles Focus Assist indicator
  - User Key B – Performs White Balance calculation.
  - User Key C – Toggles False Color > 1:1 Magnify
  - User Key D – Toggles False Color > Exposure Check
- **System Keys:** Function is defined by System Firmware.
  - Upper: Toggles False Color > Exposure Check
  - Center: Not currently defined
  - Lower: Ejects (unmounts) the currently selected Media

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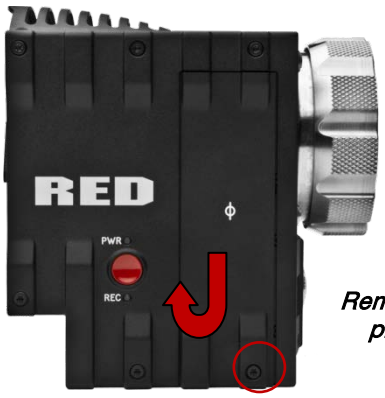
INSTALLATION / REMOVAL

WARNING: THE SIDE HANDLE IS NOT HOT SWAPPABLE - MEANING YOU CANNOT REMOVE OR INSTALL WHILE THE CAMERA IS POWERED ON. BEFORE INSTALLING OR REMOVING THE SIDE HANDLE, YOU MUST POWER DOWN THE CAMERA. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE SIDE HANDLE AND / OR CAMERA BRAIN THAT IS NOT COVERED BY WARRANTY.

To install the side handle:

1. Power down the camera if necessary.
2. Remove the brain side plate (if installed) by removing the single screw located at the bottom.
3. Rotate upwards to disengage lip at top of side plate from camera brain.



Remove screw and rotate side plate upwards to remove.

4. Insert the lip at the top of the side handle into the area where the lip from the side plate was installed.

Insert lip into top of camera brain.

Press side handle flush against camera brain.

Rotate thumbscrew upwards until tight.

5. Rotate side handle down flush along side of camera brain.
6. Rotate thumbscrew upwards until tight. Ensure side handle is secure to camera brain. You may have to apply steady pressure to get the screw started.

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To remove the side handle:

1. Power down the camera if necessary.
2. Rotate the thumbscrew downwards until detached from camera body.

3. Rotate upwards and pull down to disengage lip at top of side handle from camera brain.
4. Remove side handle from camera.

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DSMC MODULES

REAR SSD MODULE

The Rear SSD Module secures onto the back of the DSMC brain to serve as a rear location for recording onto 1.8" REDMAG SSD media.

QUAD BATTERY MODULE

- The QUAD MATTERY MODULE holds up to 4 REDVOLTs or 2 REDVOLT-XLs
- Batteries may be hot swapped

Quad Battery Module – Shown with REDVOLT batteries Installed

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DUAL BATTERY MODULE

- The DUAL BATTERY MODULE holds up to 2 REDVOLTs
- Batteries may be hot swapped

Dual Battery Module – Shown with REDVOLT batteries Installed

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MODULE INSTALLATION / REMOVAL

To install a DSCM Module to the camera, an Adaptor Plate must be purchased separately. The following procedure details installation of the Adaptor Plate and DSMC Module.

Install the Adapter Plate

1. Power down the camera.
2. Remove the REDMOTE.
3. Place the adapter plate over the v-mount on the rear of the camera brain.

4. Using a T-20 Torx, lightly tighten the four screws. Do not over tighten.

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5. Tighten the screws again in a cross pattern until tight.

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ATTACHING THE DSMC MODULE

WARNING: DSMC Modules are NOT hot swappable - meaning you cannot remove or install while the camera is powered on. Before installing or removing a Module, you MUST power down the camera. Failure to do so may result in damage to the Module and / or camera brain that is not covered by warranty.

Quad Battery Module shown.

1. Insert the lip at the top of the module into the recess at the top of the adaptor plate.

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2. Rotate module down flush with the rear of the adaptor plate.

3. While applying steady pressure to hold the module against the adaptor plate, use a T-20 Torx screwdriver to rotate the lock on the adapter plate clockwise to secure the module.

Installation is now complete.

To remove the DSMC Module and Adaptor Plate:

1. Power down the camera.
2. Use a T-20 Torx screwdriver to rotate the lock on the adapter plate to the Unlock position.
3. Rotate the module upwards and down to disengage lip at top of battery from adaptor plate.
4. Remove module from adapter plate.

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5. Use a T-20 to loosen the screws attaching the adaptor plate the camera brain.
6. Remove the adaptor plate from the camera brain.

REDMOTE

This section describes the physical controls on the REDMOTE. For complete details on REDMOTE control, refer to APPENDIX E: REDMOTE OPERATION.

IMPORTANT: For your REDMOTE to operate with this camera build version, ensure your REDMOTE has been upgraded to the latest firmware. Refer to APPENDIX E: REDMOTE OPERATION > MAINTENANCE > UPGRADING REDMOTE FIRMWARE.

REDMOTE Controls

A	Still/Motion Slider	**F**	User Keys A-D	**K**	Soft Menu Keys 4-8
B	Release Button (L)	**G**	MENU Button	**L**	Power/Lock Slider
C	Record LED	**H**	Soft Menu Keys 1-3	**M**	Release Button (L)
D	Power LED	**I**	Navigation Group	**N**	USB Connector
E	Rocker Switch	**J**	Focus / Record Button		

- **Stills / Motion Slider:** Allows selection of STILLS or MOVIE operational modes.
- **Rocker Switch:** Provides continuous adjustment of parameter specified in USER KEYS menu.
- **User Keys:** Press to initiate camera functions as defined in USER KEY menu.

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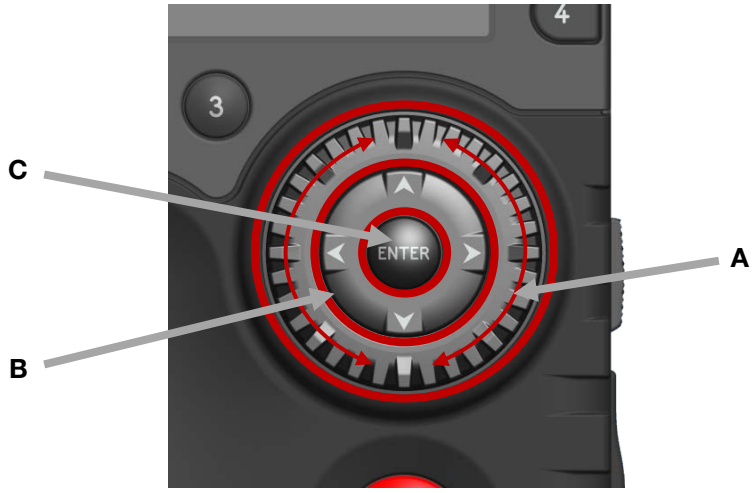
Default settings for User Function Keys A-D are as follow:

- User Key A – Toggles Focus Assist Indicator
- User Key B – Toggles False Color > RAW Check
- User Key C – Toggles False Color > 1:1 Magnify.
- User Key D – Toggles False Color > Exposure Check

- **Menu Button:** Press to access / camera setup menus.
- **Soft Menus Keys 1-3:** Below the LCD are three (3) Soft Menu buttons 1-3 (H) whose functions are defined on the LCD screen. For complete information refer to APPENDIX E: REDMOTE OPERATION > OPERATION > REDMOTE MENUS > SOFT MENU BUTTONS 1-3.
- **Navigation Group:** Allows navigation through camera menus, selection of camera parameter and adjustment of selected camera parameter.



REDMOTE Navigation Group

A	Scroll Wheel	B	Direction Keys	C	Enter Button

- **Scroll Wheel:** Selects and adjusts selected camera parameter value.
- **Direction Keys:** Navigates camera menus and may select parameter for adjustment.
- **Enter Button:** Confirms selected parameter value adjustment.

- **Focus / Record Button:** Touch for Auto Focus, fully depress to Start or Stop Record.
- **Soft Menus Keys 4-8:** To the right of the LCD are five Soft Menu buttons 4-8. These are pages displaying camera settings. For complete information refer to APPENDIX E: REDMOTE OPERATION > OPERATION > REDMOTE MENUS > SOFT MENU BUTTONS 4-8.
- **Power / Lock Slider:** Slide and hold down for two seconds to power up / down REDMOTE and or camera. Slide up to lock keys.

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DISPLAYS

BOMB EVF AND BOMB EVF (OLED)

BOMB EVF is a high-definition, lightweight viewfinder that aligns quality performance with compact form factor.

- Resolution: 1280 (wide) x 784 (high) full-color
- Contrast Ratio: 1000:1 typical
- Available diopter range: +2.0 to -5.0.l

RED BOMB EVF (OLED) brings advanced OLED technology into the field, providing truer blacks and more color accurate images

- Resolution: 1280 (wide) x 1024 (high) full-color
- Contrast Ratio: >10,00:1 typical
- Available diopter range: +2.0 to -5.0.l l

NOTE: The specific function of EVF user keys (B/C) may be programmed by the user.

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TOUCHSCREEN LCD

Red offers a five inch touch screen LCD with 800 X 400 resolution and 4:4:4 progressive scan. The touchscreen LCD allows navigation of camera menus and selection and adjustment of camera parameters by directly touching icons on the screen. Gestures supported include:

- **Tap:** Tap on an icon to bring up a quick adjustment display.
- **Hold:** Touch and hold on an icon to bring up an advanced interface display.
- **Slide:** Touch and slide on an icon to increment a value.
- **Pinch:** Touch with two fingers, then open or close to magnify or normalize the video image.

RED 5" Touchscreen LCD Shown

NOTE: Default functions shown. All keys may be programmed by the user.

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BASIC OPERATION

This section describes basic operation, starting from power up, Viewfinder layout and Menu navigation.

WARNING: THE SIDE HANDLE, SIDE SSD MODULE, REAR MODULES AND LENS MOUNT ARE NOT HOT SWAPPABLE – MEANING YOU CANNOT REMOVE OR INSTALL THEM WHILE THE CAMERA IS POWERED ON. BEFORE INSTALLING OR REMOVING ANY OF THESE ACCESSORIES, YOU MUST POWER DOWN THE CAMERA. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE ACCESSORY AND / OR CAMERA BRAIN THAT WILL NOT BE COVERED UNDER WARRANTY.

Power draw is prioritized as follows when multiple power sources are available to the camera.

1. DC (Voltage) or Brick (%)
2. Battery Module batteries
3. Side Handle battery

POWER SOURCES

SIDE HANDLE

The optional Side Handle accepts one REDVOLT.

Side Handle Battery Compartment

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QUAD BATTERY MODULE

The optional QUAD BATTERY MODULE accepts up to four REDVOLT or up to two REDVOLT XL batteries, which can power the camera and typical accessories.

Quad Battery Module

REDVOLT AND REDVOLT XL

REDVOLT and REDVOLT XL

Note: When multiple batteries are installed in the Quad Battery Module, the power management circuit will select the lowest charged battery to supply power to the camera. On depletion, a battery may be ejected from the Quad Battery Module for re-charging, and a new charged battery may be inserted in its place. i.e. batteries may be hot swapped, there is no need for the operator to power down the camera to replace a REDVOLT battery when using the Quad Battery Module.

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BACKPACK QUICKPLATE

The optional BACKPACK QUICKPLATE attaches directly to the back of the DSMC BACKPACK to provide a compact REDBRICK configuration for EPIC or SCARLET-X.

Note: DSMC BACKPACK is required for use of the BACKPACK QUICKPLATE

BACKPACK QUICKPLATE

REDBRICK

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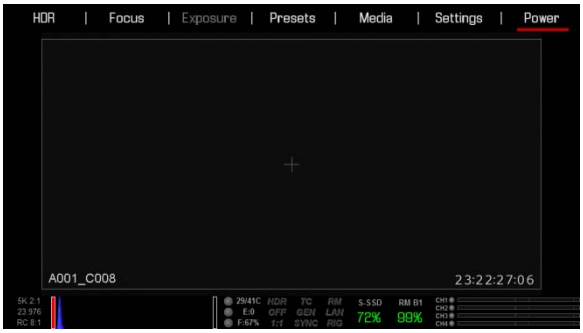
AC POWER ADAPTOR - (DSMC)

AC POWER ADAPTOR - (DSMC)

When powering from the Module it is called in the lower UI as Rear Module (RM Bx) Bay number on lower UI, and identified as Rear 1-4 in the POWER status menu.



In use, an LED on the Quad Battery Module will flash to show the battery currently powering the camera.

Current battery LED indicates status as follow:

- LED Off = No Battery
- LED Constant Green = Battery Not used but Charged
- LED Green Blinking = Battery Used (100% - 11%)
- LED Yellow Blinking = Battery has 10 minutes of run time remaining
- LED Red Blinking = Battery has 5 minutes of run time remaining
- LED Constant Red = Battery Discharged

Remaining batteries will have a steady LED on module.

When current battery reaches 4% charge, the battery module will automatically switch over another battery, by default the LOWEST charge capacity battery of the remaining batteries installed in the Module.

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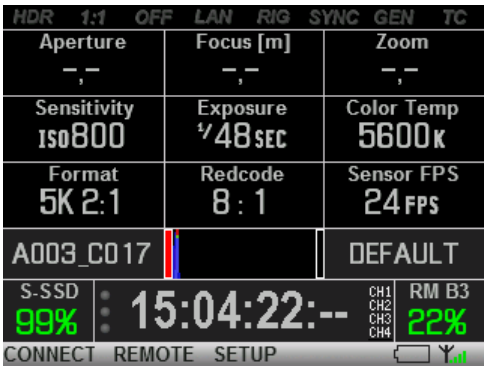
Battery location and status are displayed in the lower UI. In this case RM B1 (Rear Module, Bay 1).

Battery location and status are also displayed on REDMOTE. In this case RM B3 (Rear Module, Bay 3).



The POWER menu also shows all installed batteries and their state of charge.

EXTERNAL DC POWER

RED DSMC Cameras accept input voltages between 11.5V - 17V D.C and can draw a maximum current of 12 Amps.

- An appropriate 150W supply with DC output rated at 15V 10A such as AC Power Adapter P/N 740-0019 available from RED DIGITAL CINEMA.
- RED Charger. For RED Charger you must use 2B-to-1B Power Adapter Cable P/N 790-0138.
- RED BRICK® 140Wh batteries may be used with Backpack Quickplate, RED Quickplate, Battery Belt Clip, or RED Cradle via 2B-to-1B Power Adapter Cable P/N 790-0138.
- 4-pin XLR DC power sources may be used with the camera via adaptor cable P/N 790-0164.

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POWER UP

Locate the camera's Power / Record button on the right face of the Brain.

NOTE: This button also serves as a Record Start / Stop button once the camera is powered up.

A	Power Status LED
B	Power / Record Button
C	Media Status LED

Power / Record Button / Status LEDs

When an appropriate power source is connected to the Brain, the Power Status LED will illuminate Red. If it is illuminated, depress and then release the Power / Record button. The Power Status LED will initially go out and within 5 seconds illuminate Orange to confirm the camera is powering up, then it will illuminate Green, confirming the camera is powered up and ready to use.

If a formatted REDMAG 1.8" SSD is attached to the Brain, once powered up the Media Status LED will illuminate Green. If this LED is not illuminated, verify a formatted REDMAG 1.8" SSD is inserted into the Side SSD Module and / or format the SSD if it has not previously been formatted on the camera.

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NOTE: Once powered up, if the Power Status LED illuminates Red, it indicates low remaining battery capacity and a battery exchange or switch over to external DC power is recommended.

POWER DOWN

The camera can be powered down in two ways:

1. Using REDMOTE or Side Handle Menu controls, or via Touch Screen LCD icons. Refer to SECONDARY MENUS > POWER.
2. Depress and continue to hold the Power / Record button in its fully depressed position until the INITIATING CAMERA SHUTDOWN shows on the display.

After Power Down, the Power Status LED will illuminate Red, if an appropriate power source is available.

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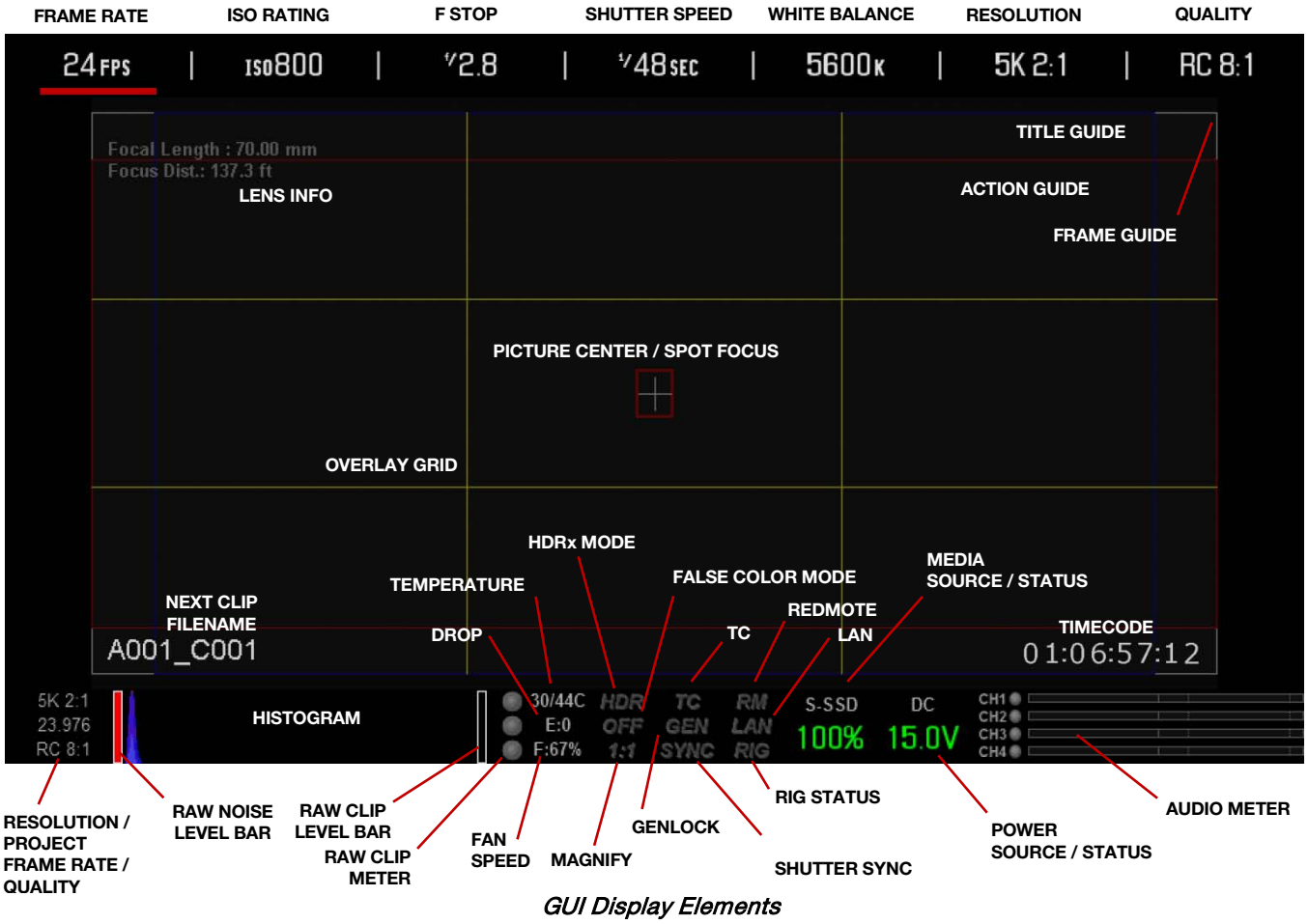
GRAPHICAL USER INTERFACE AND NAVIGATION

RED LCD/TOUCHSCREEN LCD, BOMB EVF, EXTERNAL MONITORS

The following is a general description of the structure of the camera's Graphical User Interface (GUI) which overlays the video monitor signal on the Viewfinder output(s) of the camera.



GUI Display Elements

The display elements include:

- **Frame Rate:** Current frame capture rate
- **ISO Rating:** Camera sensitivity
- **F Stop:** Functional when optional mount and lens are installed
- **Shutter Speed:** Exposure Time (or Degrees)
- **White Balance:** Color Temp
- **Resolution** Record Resolution
- **Quality:** REDCODE setting
- **Lens Info:** Lens information when using specific Canon or Cooke lenses.
- **Cursors:** Reference cursors – Safe Action / Safe Title, Picture Center, Grid Overlay

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- **Frame Guide:** Record or Projection area
- **Next Clip Filename:** Filename of the clip that will be shot next
- **Project Frame Rate:** Current project TIME BASE
- **Noise Level Bar:** Relative number of RAW pixels in noise
- **Histogram:** RGB Histogram.
- **Clip Level Bar:** Relative number of RAW pixels near clip
- **Clip Meter:** RGB sensor RAW clipping status
- **Temperature:** Displays camera sensor and core temperature in that order (xx/xxC)
- **Drop:** Indicates if any frames were dropped during recording of the clip
- **Fan Speed:** Displays fan speed in %
- **HDR Mode:** Displays HDRx mode status
- **False Color Mode:** Displays false color overlay mode
- **Magnify:** Tallies 1:1 if magnify is selected
- **TC:** Indicates presence of valid SMPTE timecode signal and Jam Sync status
- **Genlock:** Indicates presence of valid Genlock signal / sensor sync to genlock
- **Shutter Sync:** Indicates shutter sync status
- **RM:** Indicates communication to REDMOTE
- **LAN:** Indicates communication via Ethernet connection
- **RIG:** Indicates 3D rig metadata is present
- **Media Status:** Media location and remaining media capacity in %
- **Power:** Indicates D.C supply voltage or % of remaining battery capacity Including current supply voltage
- **Audio Meter:** Audio input selection and levels
- **Timecode:** Current **timecode** value
- **Menu ICON** : In the upper Right corner on the touchscreen LCD - Opens the Secondary Menus
- **Playback ICON** : In the upper Left corner on the touchscreen LCD - Accesses the Playback Function

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The GUI is broken down into the following three main sections: the Upper Status Row, the Live Action Area, and the Lower Status Row. On VIEWFINDER output(s), all three sections are visible, on PREVIEW outputs only the Live Action Area and associated graphic overlays are visible. On PROGRAM outputs, none of the graphic overlays are visible, i.e. a PROGRAM output is defined to be a CLEAN FEED output.

UPPER STATUS ROW

Provides immediate feedback on the most critical image composition parameter settings, including (from Left to Right):

- Playback Access (Touchscreen)
- Current frame capture rate
- ISO Rating
- Shutter Speed (or Shutter Angle)
- White Balance
- Record Resolution
- Record Quality
- Secondary Menus Access (Touchscreen)

Whichever parameter is underlined with a red bar may be immediately adjusted by pressing ENTER in the Navigation Group of the Side Handle or REDMOTE, then using the Scroll Wheel to change the value of that parameter. To confirm the parameter change press ENTER a second time.

NOTE: Shutter angle is displayed in Relative mode by default, as indicated by Yellow text.

If the red bar is not on the parameter you wish to change, first use the Scroll Wheel to position the red bar under that parameter, then press ENTER, adjust with the Scroll Wheel and press ENTER a second time to confirm the value change.

In the above GUI example, the Scroll Wheel has been used to move the red cursor to the Shutter Speed parameter; and the ENTER key has been pressed. This reveals the Parameter Adjust Widow. Adjust the value using the Scroll Wheel and then press ENTER to confirm the value change, then close the sub-menu.

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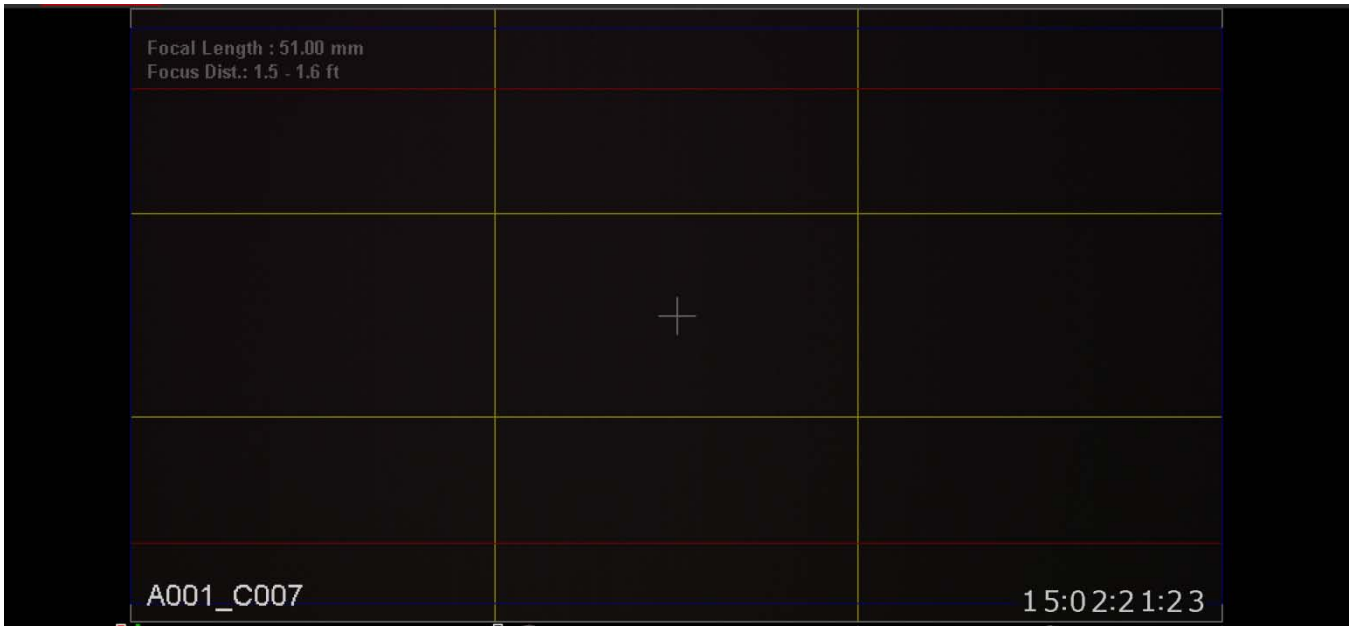
LIVE ACTION AREA

Contains the recorded image area plus Surround View™ look around area, plus overlays for Frame Guide, Safe Action / Safe Title and the current Clip Name and Timecode values. Each overlay may be color coded in one of 5 colors to maximize the contrast between the guide(s) and scene being captured.



LOWER STATUS ROW

The Lower Status Row provides feedback on key systems level camera values, including:

- Clip Settings
- Exposure (Histogram)
- Temperature, Power and Sync
- Media Status
- Power Status
- Audio Levels

ICON BEHAVIOR

TC

- TC Gray - No analog time code is currently detected.
- TC Red - Analog time code is being detected, but the use of it is not enabled.
- TC Green - Analog time code is being used to jam the time of day time code. TC will revert to gray if the signal is no longer detected.

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GEN

- GEN Gray - No genlock signal is currently detected.
- GEN Green - A genlock signal compatible with the current project and monitor rates has been locked to.

SYNC

- SYNC Gray - The sensor sync mode is not Genlock.
- SYNC Red - The sensor sync mode is Genlock, but it is not locked to any genlock signal.
- SYNC Green - A genlock signal compatible with the current project and monitor rates has been locked to and the sensor timing is also locked to it.
- SYNC Yellow

POWER STATUS

If powering camera through DC power, the current voltage will be displayed.

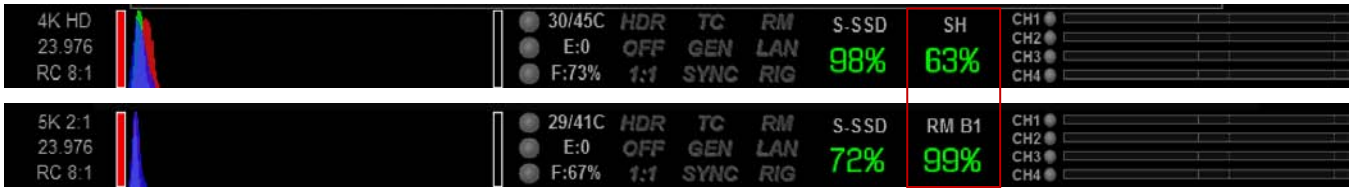
If using a REDBRICK or similar external battery to power the camera through DC IN, power status displays the current supply voltage available from the battery. Supply voltage decreases as battery is discharged, the displayed text is color coded as follows:

- Green = 12.0 V and up
- Yellow = 11.9 – 11.8 V
- Red = 11.7 – 11.6 V

NOTE: The camera will automatically power down if supply voltage drops to 11.5 Volts.

If using a REDVOLT battery in the Side Handle or Battery Module to power the camera, power status displays the location of the power source (example: SH: Side Handle; RM: Rear Module) and reports the remaining battery capacity and the displayed text is color coded as follows:

- Green: >10 minutes
- Yellow: 5-10 minutes
- Red: <5 minutes



If using a RED BRICK battery connected to DC IN, power status displays BRICK and reports the % of remaining battery capacity and the displayed text is color coded as follows:

- Green: >10 minutes
- Yellow: 5-10 minutes
- Red: <5 minutes

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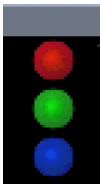
RAW CLIP METER

The RAW Clip meter looks a traffic light style meter and indicates if either of the Red, Blue or Green channels of the RAW sensor data are clipping. This meter is unaffected by White Balance, ISO, VIEW or LOOK settings and therefore represents a true measurement of the exposure levels of the sensor at all times.

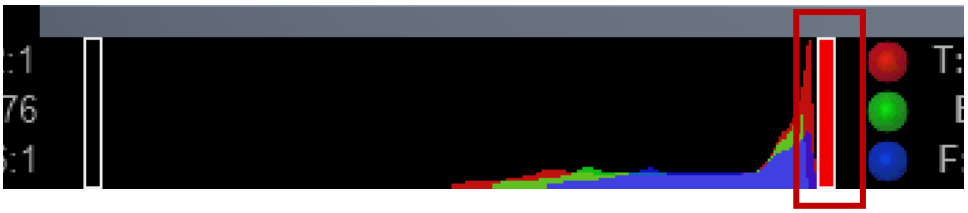


RAW NOISE LEVEL BAR

The RAW noise level bar displays the amount of pixels in the image that are in noise. For example, if the bar is about 1/8 of the total height, this would indicate approximately 1/8 of the total pixels in the image are at an exposure level at risk of displaying noise when pushed at higher ISO or FLUT values in post-production.

RAW CLIP LEVEL BAR

The RAW clip level bar displays the amount of pixels in the image that are clipping. For example, if the bar is about 1/4 of the total height, this would indicate approximately 1/8 of the total pixels in the image are at an exposure level at risk of clipping and may not be recoverable by lowering ISO or FLUT values in post-production.



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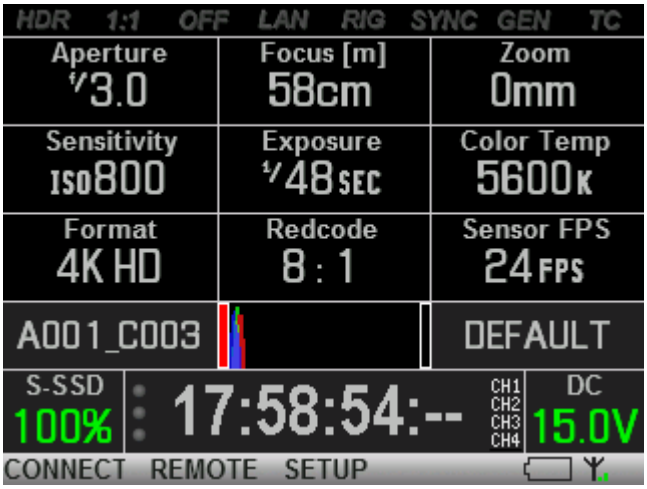
SIDE HANDLE

As you navigate and adjust settings on the camera (main menu settings only), they will be reflected on the Side Handle LCD display.

The display elements include:

- **Power:** Camera power status (DC Shown)
- **Frame Rate:** Image capture rate
- **Resolution** Recording Resolution
- **Quality:** REDCODE setting
- **ISO Rating:** Camera sensitivity
- **Shutter Speed:** Exposure Time (or Degrees)
- **White Balance:** Color Temp

REDMOTE



The display elements include:

- **Camera ID:** Displays camera ID (DEFAULT shown)
- **Wireless Status:** Displays signal strength when connected wirelessly
- **Battery Indicator:** Displays battery life or charge status (shown) of REDMOTE
- **Resolution** Recording Resolution
- **Quality:** REDCODE setting
- **Frame Rate:** Image capture rate
- **ISO Rating:** Camera sensitivity

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- **Frame Rate:** Current frame capture rate
- **Shutter Speed:** Exposure Time (or Degrees)
- **White Balance:** Color Temp
- **Resolution** Record Resolution
- **Quality:** REDCODE setting
- **Clip Filename:** Filename of the clip that will be shot
- **Project Frame Rate:** Current project TIME BASE
- **Clip Meter:** RGB sensor RAW clipping status
- **HDR Mode:** Displays HDRx mode status
- **False Color Mode:** Displays false color overlay mode
- **Magnify:** Tallies 1:1 if magnify is selected
- **TC:** Indicates presence of valid SMPTE timecode signal
- **Gen:** Indicates presence of valid Genlock signal
- **Sync:** Timecode Jam Sync status
- **RIG:** Indicates 3D rig metadata is present
- **LAN:** Indicates communication via Ethernet connection
- **Media Status:** Media location and remaining media capacity in %
- **Power:** Indicates D.C supply voltage or % of remaining battery capacity Including current supply voltage
- **Audio Meter:** Audio input selection and levels
- **Timecode:** Current timecode value
- **Histogram:** Displays histogram

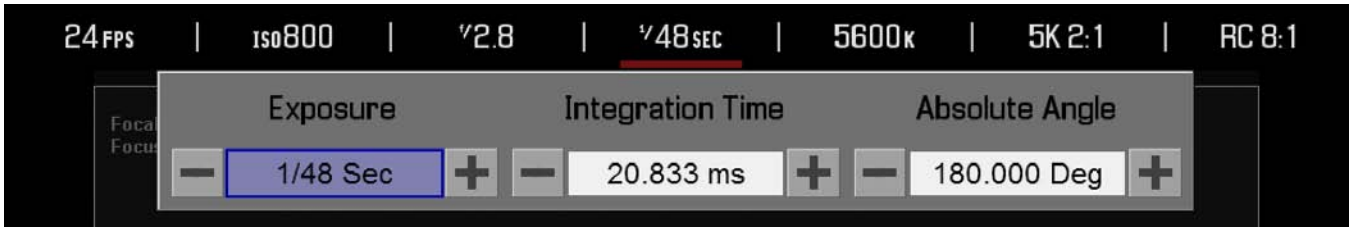
NAVIGATING MENUS

The primary method to navigate Menus is via the Scroll Wheel on the REDMOTE or Side Handle. Rotate clockwise to move right, counter clockwise to move left. However, the Left and Right direction Navigation Keys (REDMOTE or Side Handle) or Adjustment Ring (Side Handle) may also be used for this purpose.

The Up and Down direction Navigation Keys provide additional navigation functions when pressed:

UP Selects Advanced Settings menu.

DOWN Selects standard Settings menu.



As an example, position the Cursor under the Shutter Speed (24FPS) icon and press the UP Direction Key to access advanced adjustment values for Shutter Speed.

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USING TOUCHSCREEN LCD

If operating a Touchscreen LCD, camera menu navigation may be made through finger gestures.

- To adjust a parameter value, simply touch it, and then swipe the finger left / right to adjust its value.
- To access an advanced parameter settings display, press and hold down on the parameter icon.
- Touch anywhere outside the overlay windows to enter the value changes and to hide the sub-menus.
- To enter the Secondary Menus, touch the MENU icon.

- To return to the Main Menus, touch the MENU icon again.
- To access the Playback function, touch the arrow.

- To exit the Playback function, touch the circle.

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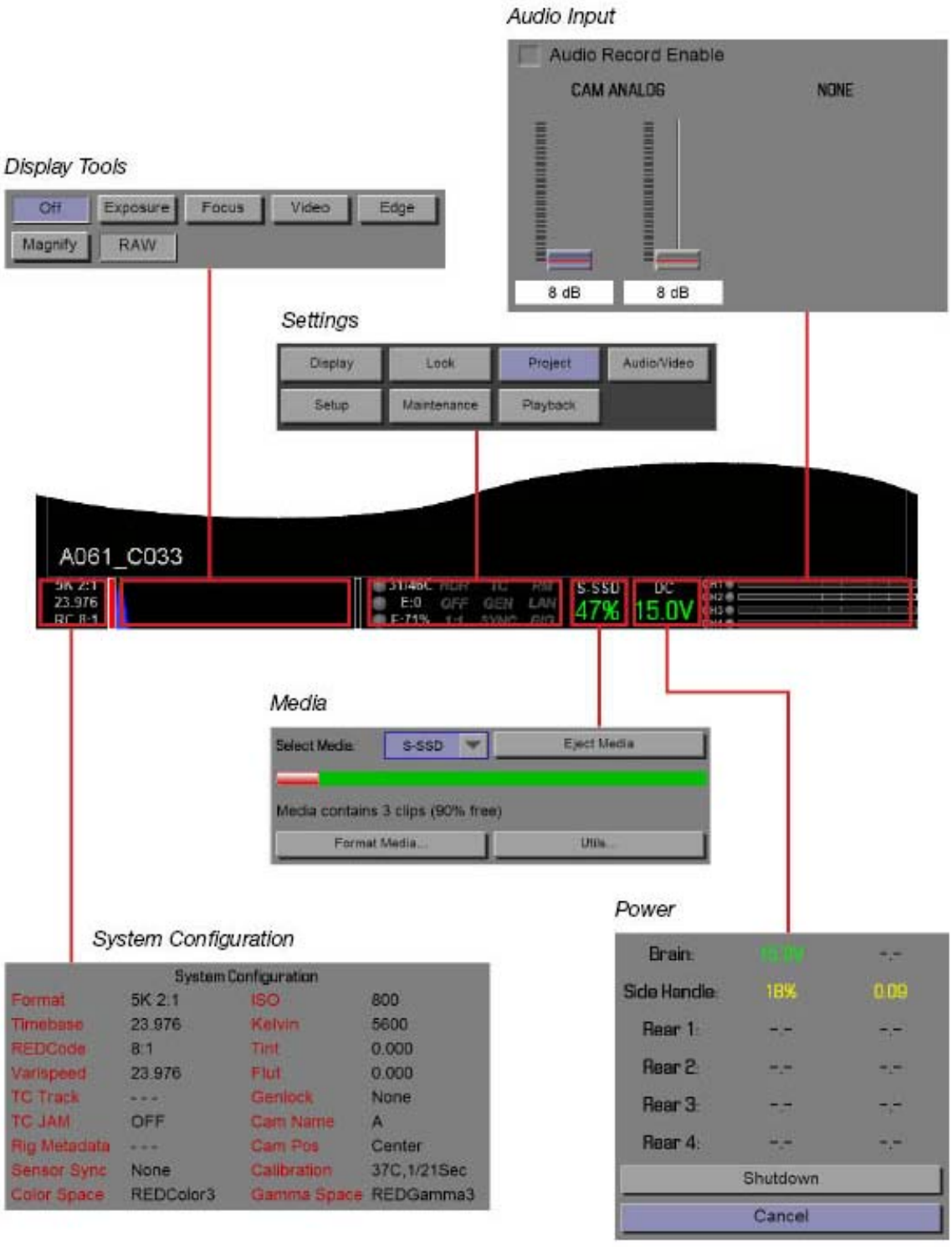
TOUCHSCREEN SHORTCUTS

The bottom portion of the touchscreen contains shortcuts to the most-used camera screens.



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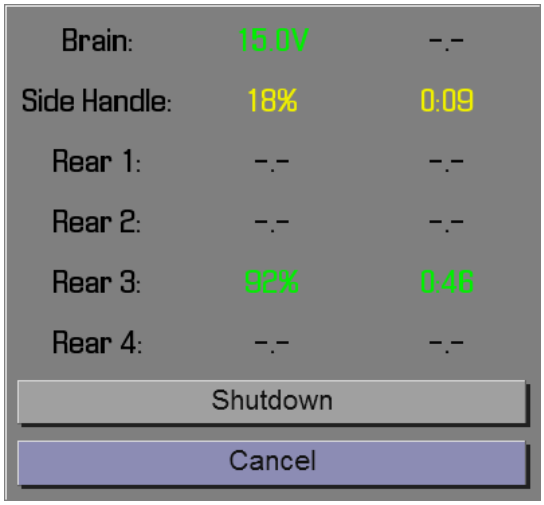
POWER DOWN

NOTE: Camera will automatically power down if supply voltage drops to 11.5 Volts.

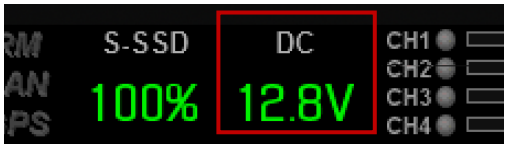
POWER MENU

1. Select the MENU icon in the right corner of the Upper Status Bar to reveal the Secondary Menus.
2. Select POWER.
3. Select SHUTDOWN.
4. The camera will immediately power down.



USING POWER STATUS DISPLAY

1. Select the POWER status located between the audio channels and media remaining indicator, to reveal the same menu illustrated above.



2. Select SHUTDOWN.
3. The camera will immediately power down.

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LOCK / UNLOCK TOUCHSCREEN OPRERATION

LOCK

To lock out the touchscreen operation, touch and hold the MENU icon until the LOCK icon displays; indicating the touchscreen has been locked out. When locked, the main menu will be displayed.

UNLOCK

To unlock out the touchscreen and allow normal operation, touch and hold the LOCK icon until the MENU icon displays; indicating the touchscreen has been unlocked.

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FIRST TIME USE – SETTING UP YOUR RED EPIC

ATTACH POWER SOURCE

If a REDVOLT battery is installed in the Side Handle and DC power is connect through the DC IN connector, the DC IN power supply has priority and will power the camera instead of the battery.

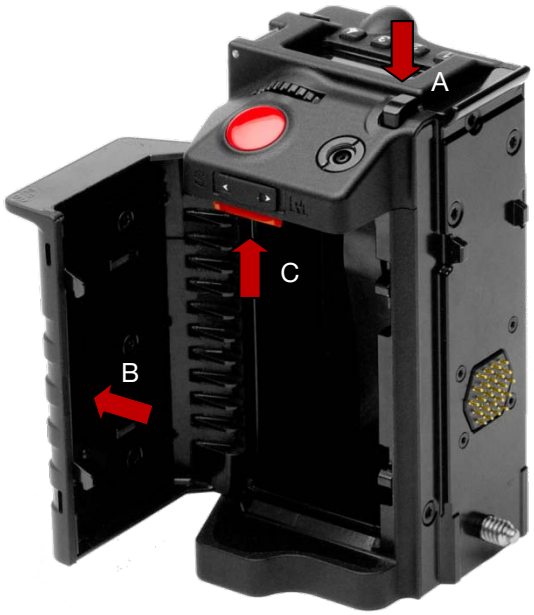
BATTERY

Connect a RED battery to the camera in one of the following ways:

SIDE HANDLE

Attach a Side Handle and insert a REDVOLT battery.

INSTALL



1. Press the battery door release button (A).
2. Open battery door (B).
3. Press upwards on retainer (C).
4. Insert a REDVOLT battery until it is fully seated and retainer (C) clicks into place.
5. Close battery door.

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REMOVE

1. Press the battery door release button (A).
2. Open battery door (B).
3. Press upwards on retainer (C) to release battery.
4. Remove battery from side handle.

QUAD BATTERY MODULE

Attach a Quad Battery Module and insert one or more REDVOLT batteries.

INSTALL

Insert battery into desired location and press until a click is heard and battery is seated.

REMOVE

1. Press the battery eject button (A) for desired battery.
2. When battery pops out, remove battery from battery module (B).

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RED BRICK

Attach to the camera using a V-Plate and 2B-to-1B Power Adapter Cable P/N 790-0138 to the DC IN connector.

DC POWER

Connect a DC power source to the camera in one of the following ways:

- Plug the RED AC Power Adapter into AC power, and the LEMO connector to the DC IN connector.
- Plug the RED CHARGER into AC power, and the LEMO connector to the DC IN connector via 2B-to-1B Power Adapter Cable P/N 790-0138.
- Plug a 12V XLR based power source into the DC IN connector via adaptor cable P/N 790-0164.

NOTE: The maximum sustainable power load of the DSMC AC Power Adapter is 150W (15V@10A). The output of the adapter is over current protected, and will shut down if an excess load condition occurs. If the output trips for any reason, remove any external loads from the camera, such as lights, motors etc, turn off the Adapter and repeat the above procedure.

POWER UP

Locate the camera's Power ON / OFF button on the right face of the Brain. If the Power Status LED is illuminated Red, depress and then release the Power / Record button. If not illuminated, check your battery charge status or external power source cable connection. Once powered up the Power Status LED will illuminate Green, confirming the camera is ready to use.

PREPARING TO RECORD

Before each days recording, the camera should be prepared as follows:

- Physically set-up camera as desired.
- Verify camera is using the latest firmware version at **www.RED.com/support** and if appropriate, upgrade the camera firmware. Refer to APPENDIX A: UPGRADING CAMERA FIRMWARE.
- Insert a blank (or previously used but erasable) REDMAG 1.8" SSD and format it.
- Perform a BLACK SHADING CALIBRATION of the Sensor.
- Check your PROJECT SETTINGS (Time Base, Record Resolution, Record Quality, etc.).
- Frame, focus and record.

CONNECT AND FORMAT MEDIA

Identify a REDMAG 1.8" 64GB, 128GB or 256GB SSD that has not previously been recorded to, or is not a camera master and may therefore be erased and re-used. Aligned the RED logo of the SSD to the outside, and then push the SSD firmly, but without excessive force, into the slot in the Side SSD Module.

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NOTE: When fully inserted, the SSD media protrudes slightly from the SSD slot as indicated above.

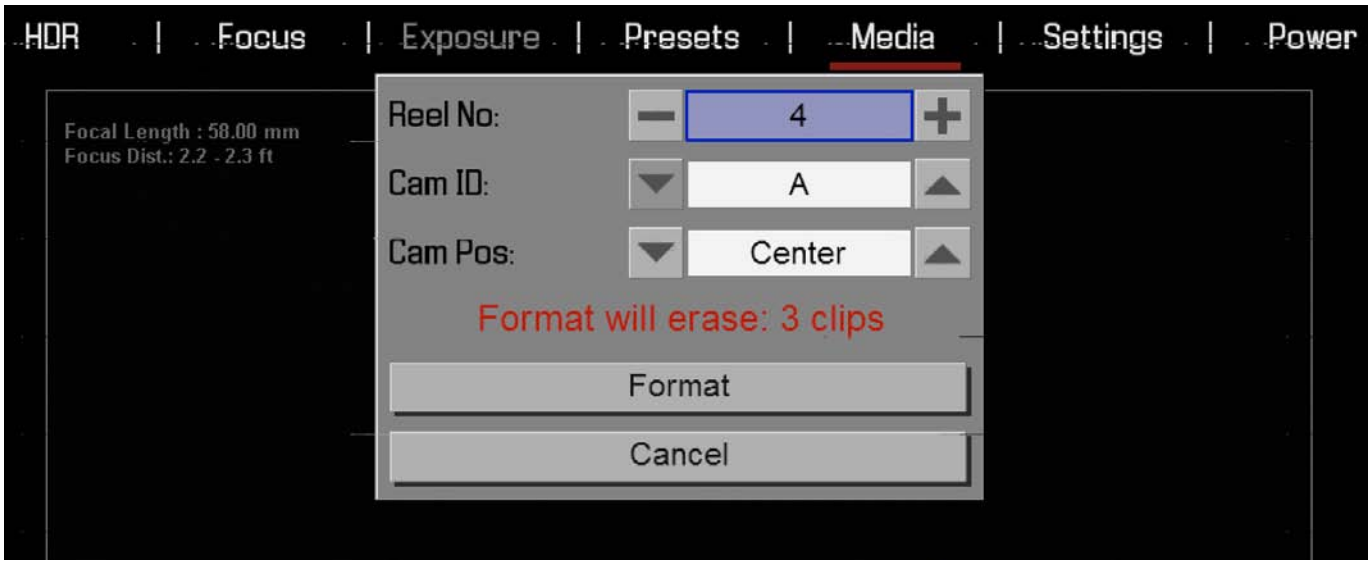
When SSD media is inserted into the camera, the camera will recognize if the media is unformatted:

- On LCD, EVF and external monitors, in the media section of the GUI, NONE will be displayed twice (as opposed to when no media is inserted, the GUI displays NONE with three dashes below "---").
- On REDMOTE, NONE will be displayed twice (as opposed to when no media is inserted, the GUI displays NONE with three dashes below "---").
- On the Side Handle, NA will be displayed (same as if no media is present).

To format the media select SECONDARY MENUS > MEDIA > FORMAT MEDIA.

When FORMAT is selected, a FORMAT dialog box will appear allowing you to add Camera Identity and 3D Position properties when formatting. When desired options are set, select FORMAT.

NOTE: If any clips will be erased on the attached media, you will be informed of the number.



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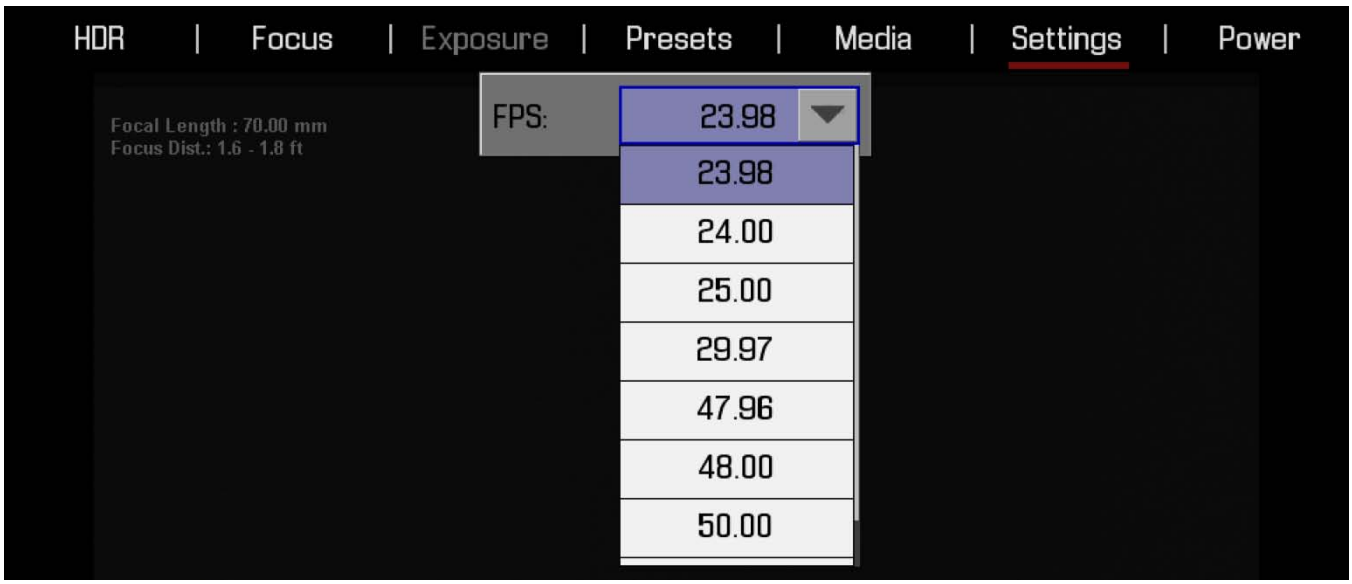
PERFORM A BLACK SHADING CALIBRATION

Refer to SECONDARY MENUS > SETTINGS > MAINTENANCE > CALIBRATION for complete details for performing a Black Shading Calibration.

ADJUST PROJECT SETTINGS

TIME BASE

To adjust the project TIME BASE, press the MENU button on the Side Handle or REDMOTE. Then use the Scroll Wheel or Direction Keys to navigate to SETTINGS > PROJECT > TIME BASE and press ENTER. Adjust to the desired value using the Scroll Wheel and press ENTER once more to confirm.



If using a Touch Screen, select SECONDARY MENUS > SETTINGS > PROJECT > TIME BASE. Adjust by sliding your finger up / down or tapping on the desired value, and then press anywhere else on the touch screen to confirm.

The following TIME BASES are currently available:

- 23.98 fps
- 24.00 fps
- 25.00 fps
- 29.97 fps
- 47.96 fps
- 48.00 fps
- 50.00 fps
- 59.94 fps

NOTE: A project can only support one Time Base as this defines the frame count to be used for time code and as the clip playback and editing frame rate. It is also the primary frame rate for acquisition, but variable speed (over-crank and under-crank) recordings can be made above and below this base frame rate using the VARISPEED menu.

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RECORD RESOLUTION

To adjust Record Resolution, navigate the Cursor to the RESOLUTION icon in the Upper Status Row and press the Navigation Group ENTER key. Adjust to the desired value using the Scroll Wheel and press ENTER a second time to confirm.

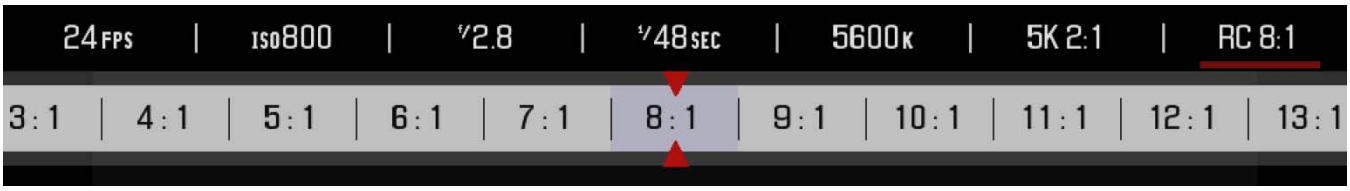
If using a Touch Screen, press the RESOLUTION ICON, adjust RESOLUTION by sliding your finger left / right, or tap on the desired resolution, and then press anywhere else on the touch screen to confirm.

The following Recording Resolutions are currently available:

- 5K
- 5K HD
- 5K 2:1
- 5K WS
- 5K ANA
- 4K
- 4K HD
- 3K
- 3K HD
- 2K
- 2K HD
- 2K WS
- 1K HD
- 1K WS

RECORD QUALITY (REDCODE)

Allows adjustment of REDCODE settings.



Range is 3:1 to 18:1

Default is 8:1

Use the scroll ribbon to select a target REDCODE compression ratio.

The camera will automatically select the closest REDCODE to the desired target.

The display will always show the "current" compression ratio being used by the camera.

If the camera is able to achieve the desired target compression ratio, it will be displayed in white. If the camera is unable to achieve the target compression ratio, it will be displayed in yellow.

The current compression ratio will automatically be re-calculated when changes are made to Resolution, FPS, HDRX Mode, Media, or Target REDCODE.

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CAMERA ID (SLATE)

If operating on a multi-camera production, enter a different Camera ID for each camera; otherwise skip this step; the camera is ready to shoot.

The Camera ID is set when the media is formatted. Refer to ADVANCED MENU > MEDIA for details.

RECORDING

Ensure a formatted REDMAG 1.8" SSD is inserted in the camera's Side SSD Module, then fully depress any one of the RECORD buttons located on the Brain, Side SSD Module, Side Handle or REDMOTE.

Fully depress again to stop recording. The camera will automatically create a unique and sequential file name for each clip recorded on the SSD based on the Camera's I.D set in the MEDIA menu.

REDCODE RAW data recordings store the Color Temperature and Exposure (ISO) and any RGB color processing values you use in the monitor path as metadata. This metadata is used in REDCINE-X or other post-production software as initial white balance, exposure and color correction points however, you are free to change these values at any time when you process the RAW footage.

Time Code and Edge Code values used by the camera are Non Drop Frame (NDF); Drop Frame (DF) is not supported. Audio is captured uncompressed at 24-bit resolution, 48KHz sample rate per channel.

Digital media such as REDMAG 1.8" SSDs are very robust, but should be treated with equal care as exposed film or a videotape master. We recommend storing digital media that contains your footage in a secure location and backing up the data to a digital archival media, such as data tape or hard disk drive.

RECORD INDICATOR

When recording, the RED DSMC camera provides a variety of record indications (tallies):

- Timecode, normally displayed in white colored text, will be displayed in red colored text.
- A small Red dot will appear in the top right corner of the VIEWFINDER output(s).

- The REC LED on the right side of the camera Brain will illuminate Red.
- REDMOTE upper LED will illuminate Red, and the Timecode will turn Red.

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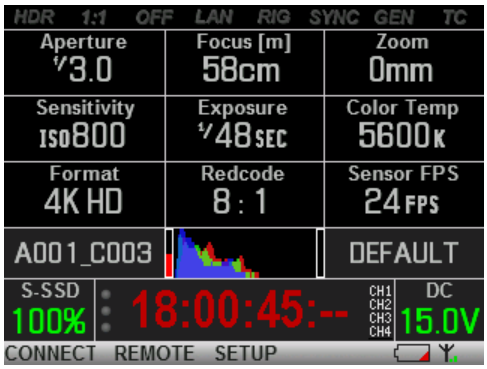
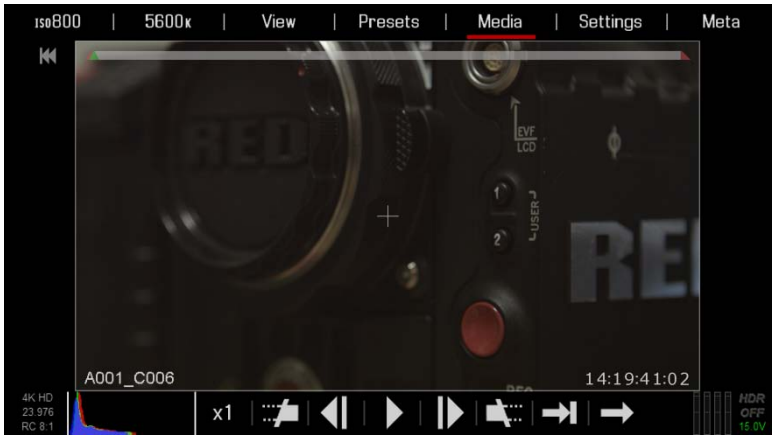


- If using a BOMB-EVF, the LED on the front will illuminate Red if Tally is enabled
- SMPTE-RP188 timecode VITC-2 HANC metadata record flag will be enabled on HD-SDI outputs.
- If enabled in the USER KEYS menu, the GPO trigger output in the CNTL connector will pulse.

PLAYBACK

Playback is available on the RED DSMC Camera by going to SECONDARY MENUS > SETTINGS > PLAYBACK or by touching the Playback arrow icon in the upper Left corner of the GUI.

The Playback function will display.



For complete details, go to SECONDARY MENUS > SETTINGS > PLAYBACK.

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MENU CONTROLS

Displayed in the Upper Display Group of the VIEWFINDER output(s), are FRAMERATE (FPS), EXPOSURE (ISO), _._ (F/Stop), WHITE BALANCE, RESOLUTION, and QUALITY (REDCODE). These parameters are adjustable directly through this screen. When using the touchscreen, directly to the right of these parameters is the MENU icon which when pressed will take you to the secondary camera set up menus.

ADJUSTMENTS

BASIC SETTING ADJUSTMENTS

SIDE HANDLE / REDMOTE

- The MENU button can be used to ENTER the secondary menus, as well as CANCEL inside lists and for navigating back up menus.
- Navigate to the desired setting using the NAVIGATION GROUP direction keys and press ENTER.
- Use the Scroll Wheel or Adjustment Ring to increase or decrease the parameter value.
- When the desired value has been selected, press ENTER to set.

BASIC ADJUSTMENTS USING SIDE HANDLE ONLY

Although not recommended, the Side Handle can be used stand alone to make basic adjustments to FPS, ISO, Shutter Speed, Resolution and REDCODE located on the Main Menu screen. Use the Navigation Group to make these adjustments while watching the cursor placement under the desired setting on the side handle LCD. When desired setting is selected, press the Enter button to access, then use the Scroll Wheel, Directional Pad or Adjustment Ring to make changes. When done, press the Enter button again to set the changed parameter. The MENU button can be used to ENTER the secondary menus, as well as CANCEL inside lists and for navigating back up menus.

TOUCHSCREEN

- The MENU ICON can be used to ENTER the secondary menus, as well as CANCEL inside lists and for navigating back up menus.
- Touch the desired parameter for adjustment.
- Slide your finger across the screen to scroll through the available parameter values.
- When desired the parameter value has been selected, touch anywhere in the screen area to set.

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- To close an alpha numeric keypad when entering information directly, tap anywhere on the screen outside the keypad.

ADVANCED SETTING MENUS

At this time, only FRAMERATE, F-STOP, SHUTTER SPEED and WHITE BALANCE on the MAIN MENU have advanced settings.

SIDE HANDLE / REDMOTE

1. Navigate to the desired setting using the NAVIGATION GROUP direction keys and then press the UP directional key.
2. Use the direction keys to navigate to the desired parameter adjustment field and press ENTER to confirm.
3. Use the Scroll Wheel to adjust the selected parameter value.
4. When desired selection is made, press the MENU button to set.

TOUCHSCREEN

1. Press and hold the desired parameter to gain access to advanced setting adjustments.
2. Press the field - a keypad type menu may appear to allow adjustments.
3. Press the desired parameter settings to adjust.
4. When desired selection is made, press anywhere in the screen area to set and exit the advanced settings submenu.

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MAIN MENU

Available options under the MAIN MENU are FRAMERATE (FPS), ISO (SENSITIVITY), F STOP, 1/SEC (EXPOSURE), WHITE BALANCE, RESOLUTION, and QUALITY (REDCODE).

FPS

Used to select an image capture frame rate that differs from the Project's TIME BASE frame rate.

Ranges are as follows:

- 1 sec – 300 fps (2K 2.4:1)
- 1 sec – 120 fps (4K HD)
- 1 sec – 96 fps (5K ANA)
- 1 sec – 120 fps (5K 2.4:1)
- 1 sec – 96 fps (5K FF)
- 1 sec – 96 fps (5K 2:1)

Default is 24 fps (or the selected Project TIME BASE frame rate if not 23.98 or 24.00 fps). 1 sec translates to 1 second per frame.

Available frame rate is dependent on Resolution and REDCODE settings. Refer to RECODE > REDCODE OPTIONS FOR VARIOUS FRAME RATES table.

VARISPEED

When a frame rate other than the current TIME BASE has been selected, the FPS text will turn Yellow and VARISPEED will be shown where the Audio Meter is normally displayed at the lower right of the display.

50 FPS | ISO 800 | -.- | f/96 SEC | 5600 K | 5K 2:1 | RC 8:1
12 FPS 24 FPS 25 FPS 30 FPS 48 FPS 50 FPS 60 FPS 72 FPS 75 FPS 90 FPS 96 FPS
A001_C005
5K 2:1
23.976
RC 8:1
T:44C HDR TC RM S-SSD DC
E:0 OFF GEN LAN 100% 12.7V
F:71% 1:1 SYNC RIG
Varispeed

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BASIC SETTINGS

Provides quick selection of the most common VARISPEED frame rates.

ADVANCED SETTINGS

When selected a numerical keypad will appear allowing the desired VARISPEED Framerate to be entered in 1 fps increments. Maximum frame rate is a function of RECORD RESOLUTION and REDCODE settings. Granularity is 0.001 FPS.

On Touchscreen systems, a Keypad is available for direct numeric entry of the VARISPEED FPS value. Touch the value bounded by the + and – labels to bring up, press outside the keypad to confirm the value.

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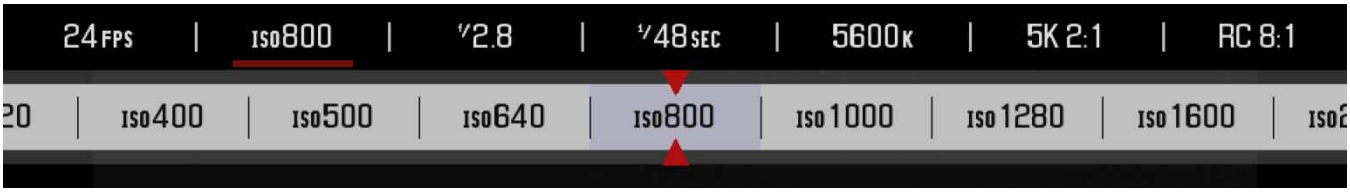
ISO (SENSITIVITY)

Adjusts the camera's ISO rating. The sensitivity value is adjustable in 1/3rd stop increments. When the ISO rating is adjusted, the camera logs the change as metadata and the monitor path reacts accordingly. Higher ISO values lead to brighter images in the monitor path, and vice versa.



Range is ISO 250 – 12800

Default is ISO 800

F STOP

Aperture controls the depth of field of the subject imaged by the camera, and in combination with the shutter speed / angle setting controls the amount of light falling on the sensor. i.e. exposure. Increasing the F stop to a higher number reduces exposure as well as increases the depth of field, decreasing the F stop to a lower number increases the exposure and decreases the depth of field. You can chose either 1/3 or 1/4 stops.

RED DSMC Ti PL Mount Installed

When a lens equipped with Cooke's S4/i system is attached to the DSMC Ti PL Mount, the camera will display the current aperture (F stop) of the attached lens. This is for information only and on-camera adjustment is NOT available, manual adjustment only as indicated by being Grayed out.

DSMC Canon Mount Installed

This menu will appear when a DSMC Canon Mount is installed and a Canon EF or EF-S Lens or equivalent is attached (a Non-Canon EF or EF-S Lens may not function as smoothly or accurately). Adjusts the aperture (F stop) of the attached lens.

The attached lens for the example shown is a Canon EF 24-70mm.

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BASIC SETTINGS

Allows adjustment of the aperture (F stop) of the attached lens. The range will vary depending on the attached lens.

ADVANCED SETTINGS

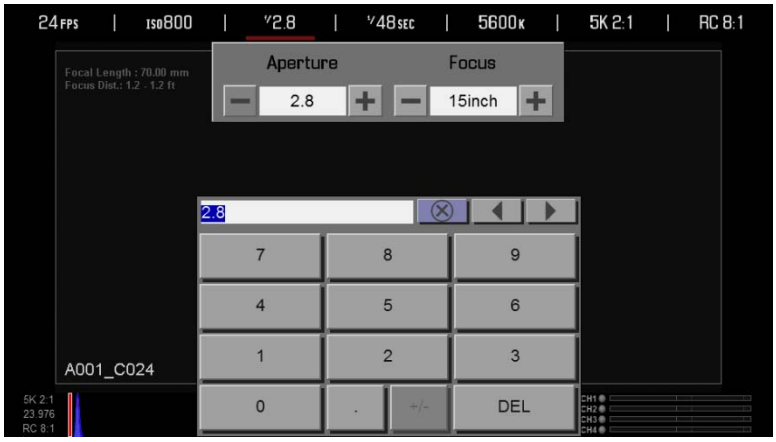
When selected, the advanced settings menu allows fine control over the f-stop value under APERTURE and focal distance under FOCUS.

APERTURE (F STOP)

Provides the ability to enter the F stop value directly.

Range depends on attached lens.

Default depends on attached lens.



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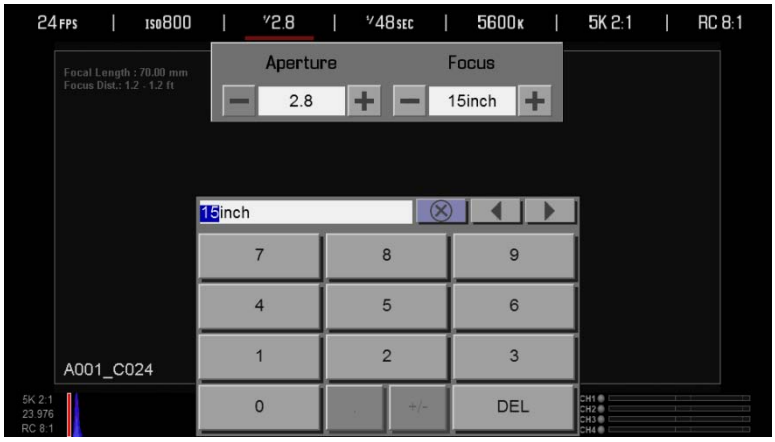
FOCUS

Provides the ability to enter the focal distance directly.

Range depends on attached lens.

Default depends on attached lens.



EXPOSURE

BASIC SETTINGS

Adjusts the exposure of each frame captured by the MYSTERIUM X sensor. Shutter speed presets are provided for all common speeds (and shutter angles) for 24 / 25 fps and 50 / 60 fps project frame rates.

Decreasing Shutter Speed increases the amount of time over which light falls on the sensor, increasing exposure and motion blur on any objects moving within the frame. Increasing Shutter Speed shortens the amount of time over which light falls on the sensor, decreasing exposure and motion blur on objects moving within the frame.

Range is 1/24th sec – 1/8000th sec - Slowest available speed is 1 second per frame / frame rate, so for 24 fps it is 1/24th sec.

Default is 1/48th Sec.

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ADVANCED SETTINGS

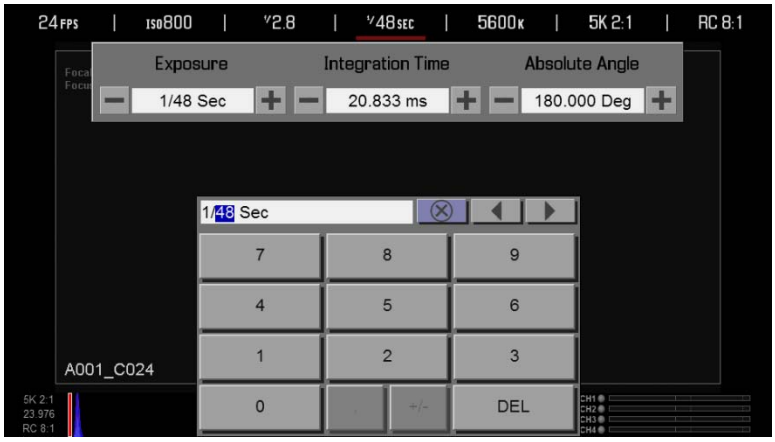
When selected, the advanced settings menu allows fine control over the Exposure value, and permits entry in any of the three following common units – EXPOSURE (Shutter Speed), INTEGRATION TIME or ABSOLUTE ANGLE (Shutter Angle).

EXPOSURE (SPEED)

Provides the ability to enter the Exposure value as a Shutter Speed (1/xx sec).

Range is 2 – 1/8000th Sec - Slowest available speed is 1/frame rate, so for 24 fps it is 1/24th Sec.

Default is 1/48th Sec.



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INTEGRATION TIME

Provides the ability to enter the Exposure value as a Shutter Integration Time (xx milliseconds).

Range is 0.125 to 41.708 mS (milliseconds)

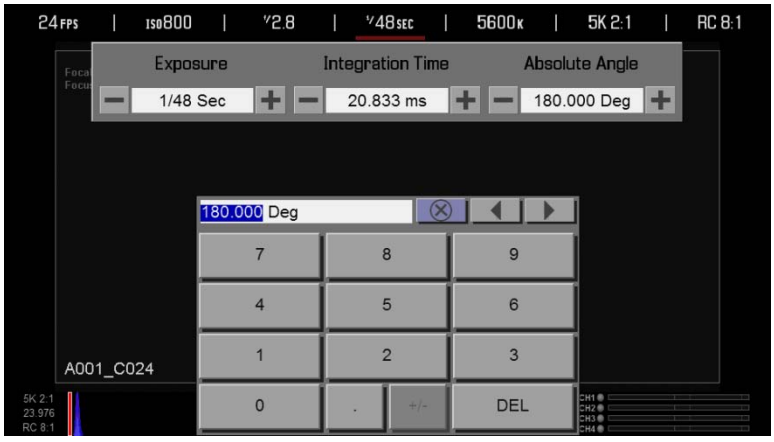
Default is 20.833 MS

ABSOLUTE ANGLE

Provides the ability to enter the Exposure value as a Shutter Angle (xx Degrees).

Range is 1.000 to 360.000 Degrees

Default is 180.0 Degrees



As you adjust any of these three parameters, the camera will automatically calculate the equivalent value in the other units, but as a quick reference here are some common Speeds and Angles.

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To Convert Shutter Speed to Angle Equivalent:

Equivalent Degrees = (Shutter Speed x Frame Rate x 360)

E.g. = (1/48 x 24 x 360) = (8640/48) = 180

SHUTTER	DEGREES	SHUTTER	DEGREES
1/32	270	1/120	72
1/48	180	1/192	45
1/50	172.8	1/348	22.5
1/60	144	1/696	11
1/96	90	1/1000	8.6

Equivalent Shutter = 1 / (Frame Rate x 360 / Angle)

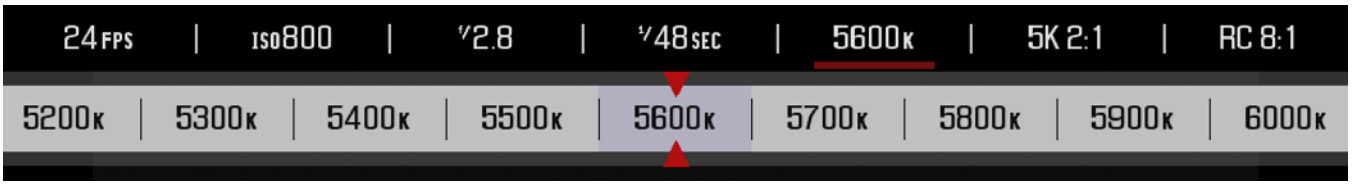
E.g. = 1/ (24 x 360/180) = 1/ (8640/180) = 1/48

DEGREES	SHUTTER	DEGREES	SHUTTER
270	1/32	72	1/120
180	1/48	45	1/192
172.8	1/50	22.5	1/348
144	1/60	11	1/696
90	1/96	8.6	1/1000

WHITE BALANCE

BASIC SETTINGS

Allows you to manually set Color Temperature in the range from 1,700 to 100,000 KELVIN.



Range is 1,700 K to 10,000 K.

Default is 5600K.

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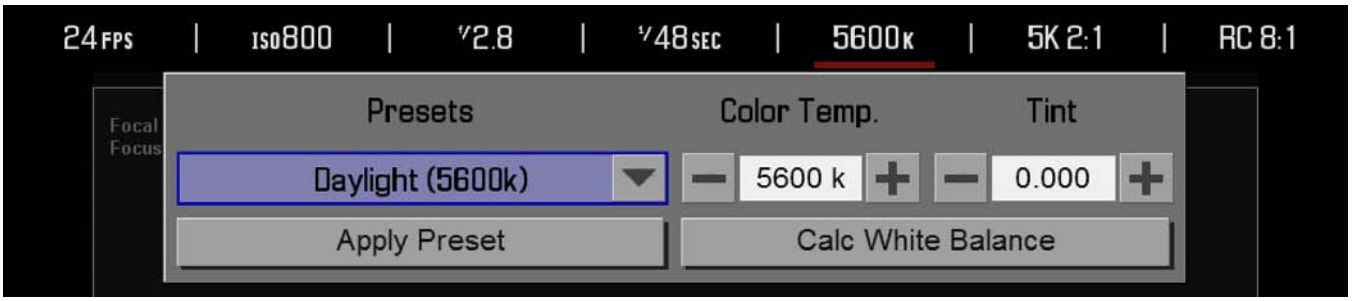
ADVANCED SETTINGS

When selected, allows additional adjustment of the White Balance. Available options are PRESET, COLOR TEMP, TINT, and CALCULATE WHITE BALANCE. Press APPLY PRESET for settings to take effect.



PRESET

Available preset options are:

SHADE
Preset to 9,000K

DAYLIGHT
Preset to 5,600K

FLOURESCENT
Preset to 4,500K

INCANDECENT
Preset to 2,800K

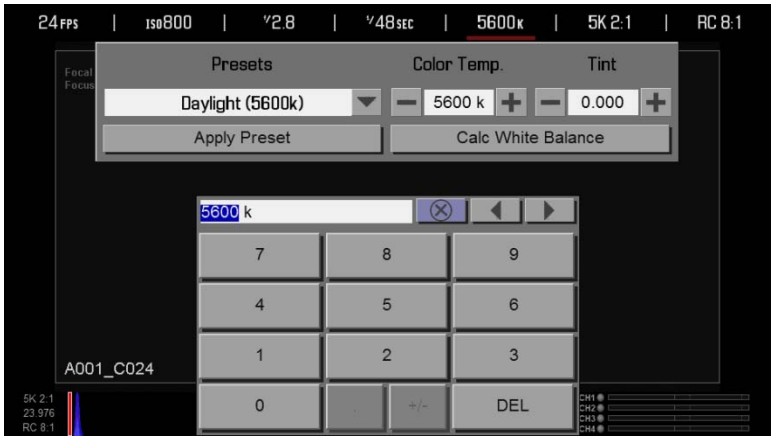
CLOUDY
Preset to 7,500K

FLASH
Preset to 5,500K

TUNGSTEN
Preset to 3,200K

COLOR TEMP

Allows you to manually set Color Temperature in the range from 1,700 to 100,000 KELVIN. Default is 5600K.



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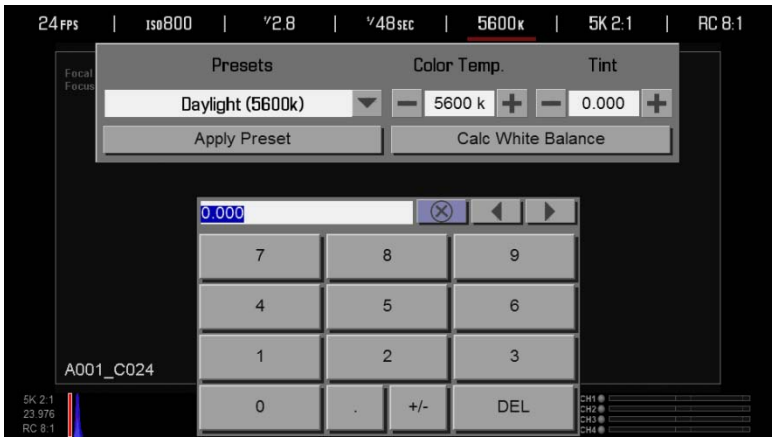
TINT

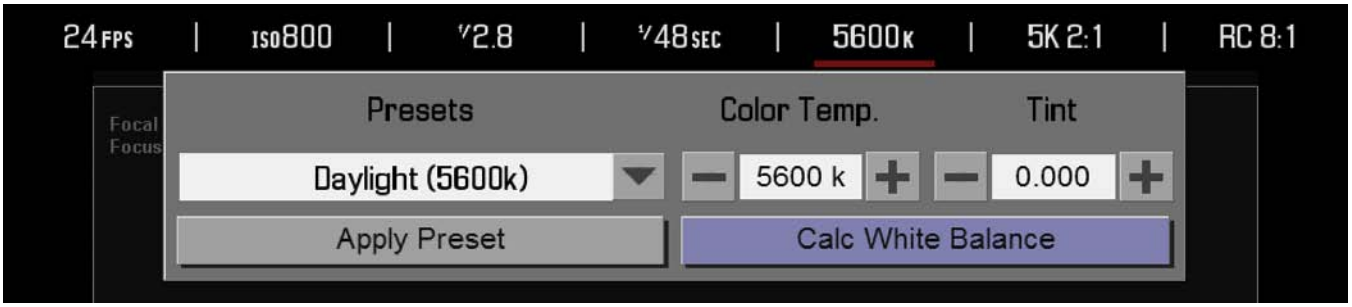
Color Temperature calculations assume a pure light source that may not be true in the specific scene the camera is imaging. To compensate for any residual colorcast, the TINT parameter can adjust the RGB color balance with a compensating Magenta - Green color component. Default is 0.000. When selected, a secondary keypad will appear allowing you to enter the desired Tint value directly.

NOTE: Selecting Calc White Balance calculates a new Tint value. This is maintained if the Color Temp is adjusted via the Color Temp parameter. If you select ANY presets, Tint will be reset to zero, which is the default value.



CALC WHITE BALANCE

The Calc White Balance function analyzes the central 25% of the image visible in the monitor to calculate a Color Temperature that will render a white object as white.



To use Calc White Balance function, place a White or Gray object under the ambient light, select the Calc White Balance function and then press the Calc White Balance function box. Calc White Balance is also assigned to a User Key on the REDMOTE and Side Handle as a factory default setting.

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RESOLUTION

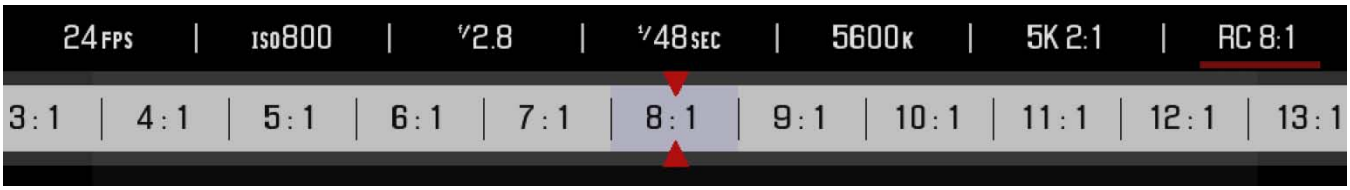
Allows adjustment of resolution.

Default is 5K 2:1

FORMAT	WIDTH (PX)	HEIGHT (PX)
1K WS	1280	480
1K HD	1280	720
2K WS	2048	854
2K HD	1920	1080
2K	2048	1080
3K HD	2880	1620
3K	3072	1620
4K HD	3840	2160
4K	4096	2160
5K ANA	3600	2700
5K WS	5120	2160
5K 2:1	5120	2560
5K HD	4800	2700
5K	5120	2700

REDCODE

Allows adjustment of REDCODE settings.



Range is 3:1 to 18:1

Default is 8:1

Use the scroll ribbon to select a target REDCODE compression ratio.

The camera will automatically select the closest REDCODE to the desired target.

The display will always show the "current" compression ratio being used by the camera.

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If the camera is able to achieve the desired target compression ratio, it will be displayed in white. If the camera is unable to achieve the target compression ratio, it will be displayed in yellow.

The current compression ratio will automatically be re-calculated when changes are made to Resolution, FPS, HDRX Mode, Media, or Target REDCODE.

REDCODE OPTIONS FOR VARIOUS FRAME RATES

Minimum frame rate is 1 sec per frame; maximum frame rate is a function of REDCODE setting, and record resolution:

FPS	24	25	30	48	50	60	72	75	90	96	100	120	150	175	210	250	288	300
5K FF	RC 3:1	RC 4:1	RC 4:1	RC 6:1	RC 7:1	RC 8:1	RC 9:1	RC 10:1	RC 12:1	RC 12:1	-	-	-	-	-	-	-	-
5K 2:1	RC 3:1	RC 3:1	RC 4:1	RC 6:1	RC 6:1	RC 8:1	RC 9:1	RC 9:1	RC 11:1	RC 12:1	-	-	-	-	-	-	-	-
5k ANA	RC 3:1	RC 3:1	RC 3:1	RC 4:1	RC 5:1	RC 5:1	RC 6:1	RC 7:1	RC 8:1	RC 8:1	-	-	-	-	-	-	-	-
5K 2.4:1	RC 3:1	RC 3:1	RC 3:1	RC 5:1	RC 5:1	RC 6:1	RC 8:1	RC 8:1	RC 9:1	RC 10:1	RC 10:1	RC 12:1	-	-	-	-	-	-
4K HD	RC 3:1	RC 3:1	RC 3:1	RC 4:1	RC 4:1	RC 5:1	RC 6:1	RC 6:1	RC 7:1	RC 8:1	RC 8:1	RC 10:1	-	-	-	-	-	-
2K 2.4:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 4:1	RC 5:1	RC 6:1	RC 7:1

SECONDARY MENUS

Press the Menu button on the REDMOTE / Side Handle or touch the MENU icon on the LCD to access the Secondary Menus.

Available options in this menu screen are HDR, FOCUS, PRESETS, MEDIA, SETTINGS, and POWER. EXPOSURE is not implemented at this time.

HDR MENU

Available options are HDR OFF, HDRx and STOPS.

NOTE: HDR mode cannot be modified when in Magnify 1:1 mode.

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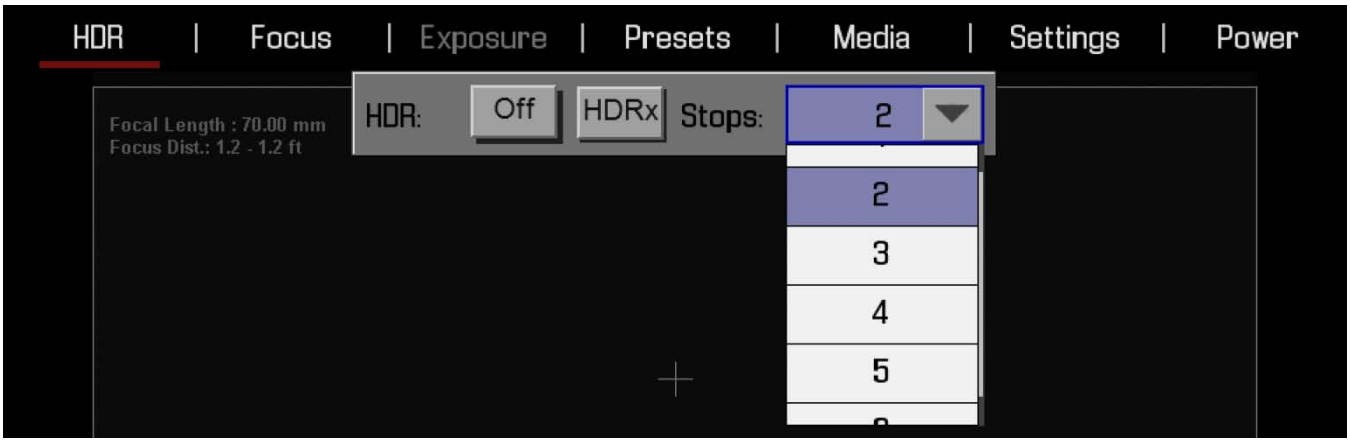
HDR ON / OFF

By default, HDRx is OFF (HDR button is illuminated Blue). In the Lower Status Group of the Viewfinder screen, the HDR text is Gray, indicating HDRx is inactive.

To turn HDRx on, navigate to the HDRx button using the Navigation Group and press ENTER, or from the touchscreen directly touch the HDRx button. In the Lower Status Group of the Viewfinder screen, the HDR text will turn White, indicating HDRx is active.

STOPS

To adjust the STOPS parameter, select the Stops box and use the UP / DOWN arrows to adjust.

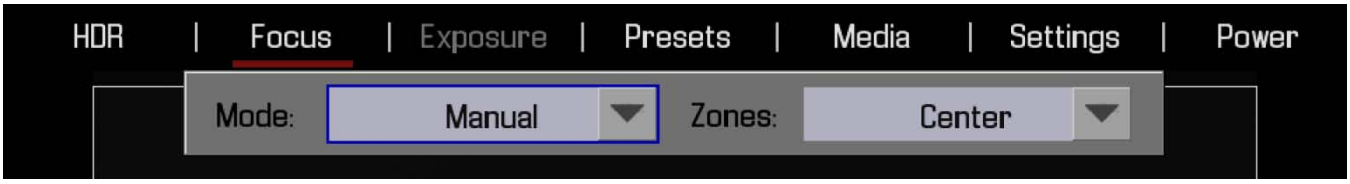


Range is 1 to 6.

Default is 2.

FOCUS MENU

The Focus Menu is used to enable and select Focus parameters including MODE and ZONES.



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MODE

MANUAL FOCUS

To adjust the MODE parameter, select the Menu box and use the UP / DOWN arrows to adjust. Available options are MANUAL and CONFIRM. Default is MANUAL.

MANUAL

When selected all focus operations are manual.

CONFIRM

Enables the Center or Spot focus square for use with manual focus. This mode provides additional focus assistance to the photographer using RED, YELLOW, and GREEN color changes to the focus spot window. Inadequate subject illumination and/or contrast may interfere with normal Focus Confirm operation.

For best results with Focus Confirm, operators should 'rock' the focus ring -- focusing through the point of optimum focusing and back again in decreasing amplitude -- as when 'zeroing-in' for precision manual focus.

AUTO FOCUS

NOTE: The following menus will ONLY appear if a DSMC Canon Mount is installed with a Canon or Sigma lens attached.

With a DSMC Canon Mount installed and a supported lens attached, available options become MANUAL, CONFIRM, SINGLE, CONTINUOUS, TOUCH TRACK, and RACK. Default is MANUAL.

All settings except MANUAL place a single square (Center) or a single rectangle (Spot) on the screen (depending on the ZONES selection) that indicate where the image is in focus.

Pressing the designated button for spot focus (REDMOTE / Side Handle button A default) will cycle you through each Focus Mode option in order as you press the button repeatedly.

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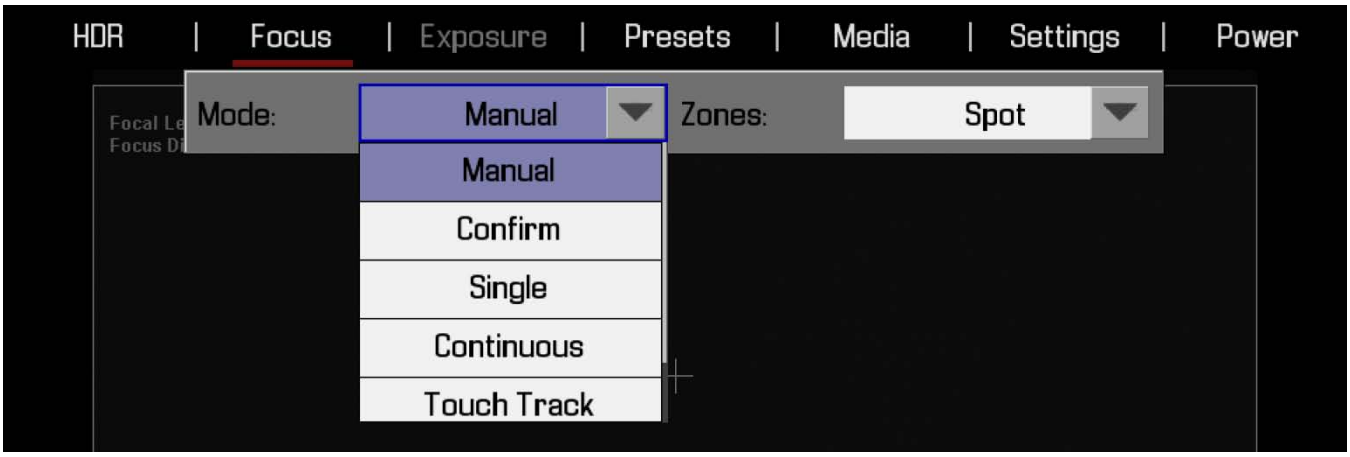

Performance of Auto Focus may be reduced under the following conditions:

- The subject is dark or distant.
- There is inadequate contrast between the subject and background.
- The scene has reflective highlights.
- The subject is backlit.
- There is inadequate surface contrast/detail inside the window.

NOTE: Edge Mode can be used for additional assistance in these conditions. Refer to SETTINGS MENU > DISPLAY > TOOLS > EDGE.

MANUAL

When selected all focus operations are manual.

CONFIRM

Enables the Center or Spot focus square for use with manual focus. This mode provides additional focus assistance to the photographer using RED, YELLOW, and GREEN color changes to the focus spot window. Inadequate subject illumination and/or contrast may interfere with normal Focus Confirm operation.

For best results with Focus Confirm, operators should 'rock' the focus ring -- focusing through the point of optimum focusing and back again in decreasing amplitude -- as when 'zeroing-in' for precision manual focus.

SINGLE

A Focus / Record Button half-press performs single-shot AF. Optimized for rapid focus even under low-contrast conditions. Works with both Center and Spot Zones.

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CONTINUOUS

Once engaged with half-press, will attempt to keep objects in AF window in focus. Works best with good lighting and contrast. Works with both Center and Spot Zones.

TOUCH TRACK

Dynamically updating positionable AF using touchscreen. Works with Spot Zone only. Keep AF Spot on subject while moving across frame, will continuously focus on spot.

RACK

For quickly selecting two focus points and executing rack focus between them. Focus points are selected using the Touchscreen. Shutter half-press executes rack movement. Works with Spot Zone only.

Rack mode remembers the last Center or Spot position and focus setting as the first rack point. A second rack point needs to be defined by moving the spot window to the desired second location. If the spot window is not moved, a shutter half-press will only cause the lens to execute a single AF adjustment on the original Spot. On the other hand, when two rack points have already been defined, the rack point can be updated by moving the spot to a new location. This will replace the rack point that is not in focus at that moment.

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DSMC CANON MOUNT ELECTRONICALLY SUPPORTED LENSES

Canon EF 100-400mm f/4.5-5.6L IS
Canon EF 100mm f/2.0 USM
Canon EF 100mm f/2.8L Macro IS USM
Canon EF 135mm f/2.0L
Canon EF 135mm f/2.8 Soft Focus
Canon EF 14mm f/2.8L II USM
Canon EF 15mm f/2.8 Fisheye
Canon EF 16-35mm f/2.8L II
Canon EF 17-40mm f/4L
Canon EF 180mm f/3.5L Macro
Canon EF 200mm f/2.0L IS
Canon EF 200mm f/2.8L II
Canon EF 20mm f/2.8 USM
Canon EF 24mm f/1.4L II
Canon EF 24-105mm f/4L IS
Canon EF 24-70mm f/2.8L
Canon EF 24mm f/2.8
Canon EF 28-300mm f/3.5-5.6L IS
Canon EF 28mm f/1.8 USM
Canon EF 28mm f/2.8
Canon EF 300mm f/2.8L IS
Canon EF 300mm f/4L IS
Canon EF 35mm f/1.4L
Canon EF 35mm f/2
Canon EF 400mm f/2.8L IS
Canon EF 400mm f/4.0 DO IS
Canon EF 400mm f/5.6L
Canon EF 500mm f/4L IS
Canon EF 50mm f/1.2L
Canon EF 50mm f/1.4 USM
Canon EF 50mm f/2.5 Compact Macro
Canon EF 600mm f/4L IS
Canon EF 70-200mm f/2.8L IS
Canon EF 70-200mm f/2.8L IS II USM
Canon EF 70-200mm f/4L
Canon EF 70-300mm f/4-5.6 IS USM
Canon EF 70-300mm f/4.5-5.6 DO IS USM
Canon EF 800mm f/5.6L IS
Canon EF 85mm f/1.2L II
Canon EF 85mm f/1.8 USM
Canon EF-S 10-22mm f/3.5-4.5 USM
Canon EF-S 17-55mm f/2.8 IS USM
Canon EF-S 18-200mm f/3.5-5.6 IS
Canon EF-S 60mm f/2.8 Macro USM
Sigma 10-20mm f/3.5 EX DC HSM
Sigma 20mm f/1.8 EX DG ASP RF
Sigma 24-70mm f/2.8 IF EX DG HSM
Sigma 50mm f/1.4 EX DG HSM
Sigma 70-200mm f/2.8 EX DG APO Macro HSM II
Sigma 85mm f/1.4 EX DG HSM
Sigma APO 50-150mm f/2.8 II EX DC APO HSM
Zeiss Distagon T* 18mm f/3.5
Zeiss Distagon T* 21mm f/2.8
Zeiss Distagon T* 25mm f/2
Zeiss Distagon T* 28mm f/2
Zeiss Distagon T* 35mm f/2
Zeiss Planar 50mm f/1.4 ZE
Zeiss Makro-Planar 50mm f/2
Zeiss Planar T* 85mm f/1.4
Zeiss Makro-Planar 100mm f/2
Zeiss Distagon T* 18mm f/3.5
Zeiss Distagon T* 21mm f/2.8
Zeiss Distagon T* 25mm f/2
Zeiss Distagon T* 28mm f/2
Zeiss Distagon T* 35mm f/2
Zeiss Planar 50mm f/1.4 ZE
Zeiss Makro-Planar 50mm f/2
Zeiss Planar T* 85mm f/1.4
Zeiss Makro-Planar 100mm f/2

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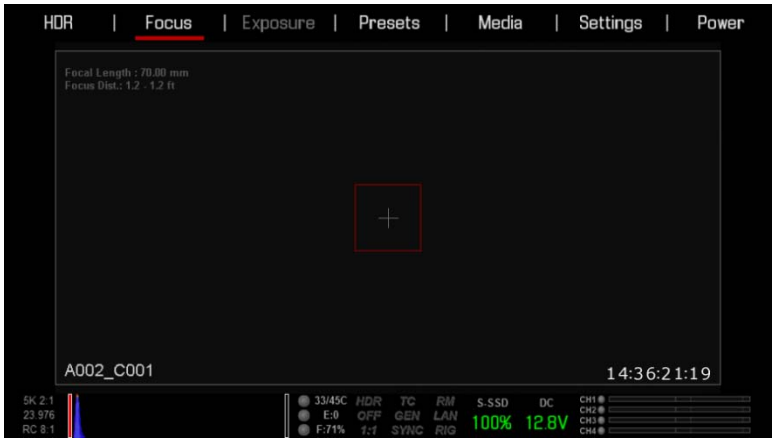
ZONES

Available options are CENTER and SPOT. Default is CENTER. This control allows selection of the boxes used to indicate objects in/out of focus.

CENTER

Provides a large, square target for focus. When objects located in the circle are in focus, the square will be Yellow or Green. When objects located in the square are out of focus, the square will be Red.



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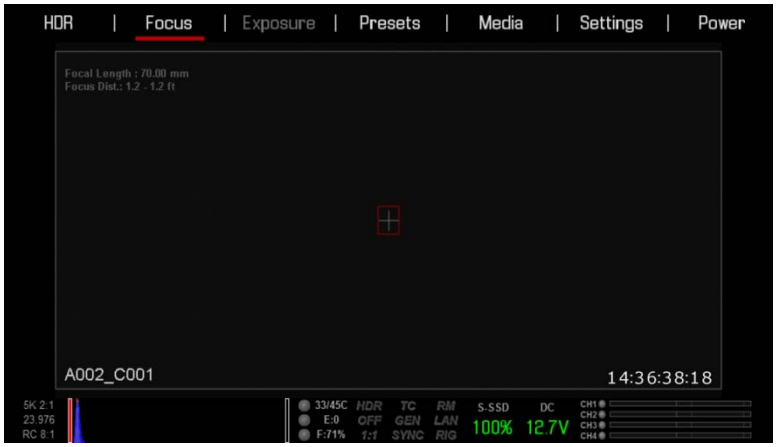
SPOT

Provides a small, square target for precise focus (similar to Center focus, only smaller). When objects located in the square are in focus, the square will be Yellow or Green. When objects located in the square are out of focus, the square will be Red.



SPOT FOCUS INDICATOR

Moving

The spot focus square can be moved around the screen.

Touchscreen

Tap on the spot focus square directly on the touchscreen and drag to the location you wish to relocate the spot focus circle.

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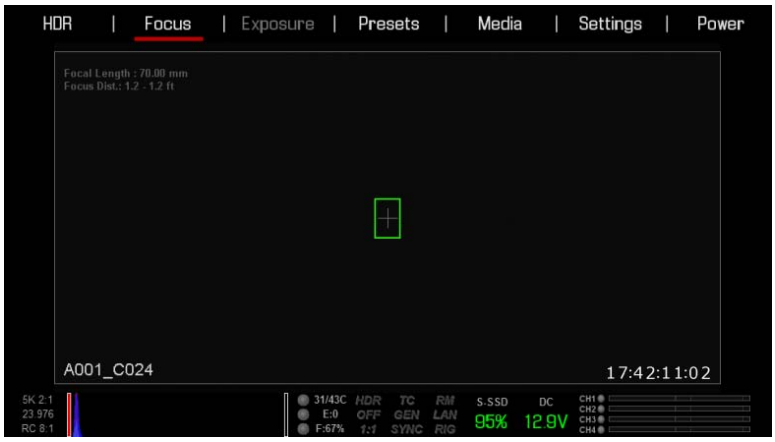
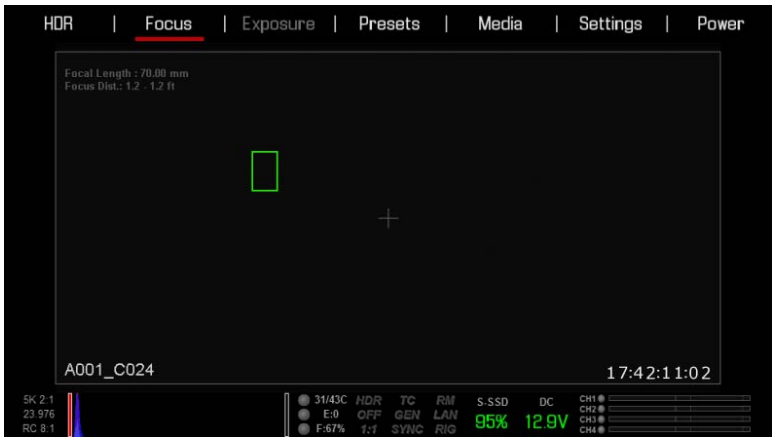
Side Handle / REDMOTE

1. Navigate to the focus menu.
2. Press the down arrow on the Navigation Group.
3. The spot focus square line weight will increase and the Red cursor under FOCUS will dim slightly.



4. Press the ENTER button.
5. Use the directional arrows to move the Spot Focus square to the desired location.



6. To exit:
   - Press the ENTER button, the spot focus square line weight will increase, then press the UP arrow to go back to the FOCUS menu.
   - Press the MENU button.

Resizing

The spot focus square can be resized using the Navigational Wheel or the Touchscreen.

Touchscreen

Tap two times on the square directly on the touchscreen to increase size. You can increase the size 3 times. After that, when you double-tap the spot focus square, it will decrease in size.

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LENS INFORMATION DISPLAY

RED DSMC TI PL MOUNT + LENS

When a RED DSMC Ti PL Mount is installed and a Lens equipped with Cooke's S4/i system (or equivalent is attached, the Focal Length and Focal Distance is displayed on the LCD, EVF and external monitors.

The focal length and focal distance values and range will vary depending on the attached lens. When the focal length or focal distance of the lens is manipulated, the current values are displayed.

DSMC CANON MOUNT + LENS

When a DSMC Canon Mount is installed, and a Canon EF or EF-S Lens or equivalent is attached, the Focal Length and Focal Distance is displayed on the LCD, EVF and external monitors. When AF is set to Manual or Confirm mode, the focus distance displays as a pair of Near - Far distances. When it is in AF mode, a single estimated Focus distance is displayed.

The focal length and focal distance values and range will vary depending on the attached lens. When the focal length of the lens is manipulated, the current value is displayed under Focal Length. The Focal Distance can be changed under MAIN MENU > -.- (F-STOP) > ADVANCED SETTINGS.

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EXPOSURE MENU

Not implemented at this time.

PRESETS MENU

CAMERA PRESETS

Camera Presets are used to store and recall camera setup information such as LOOKs, key mappings, I/O configuration, etc.

Your RED DSMC camera has a number of factory-installed settings.

APPLYING A PRESET

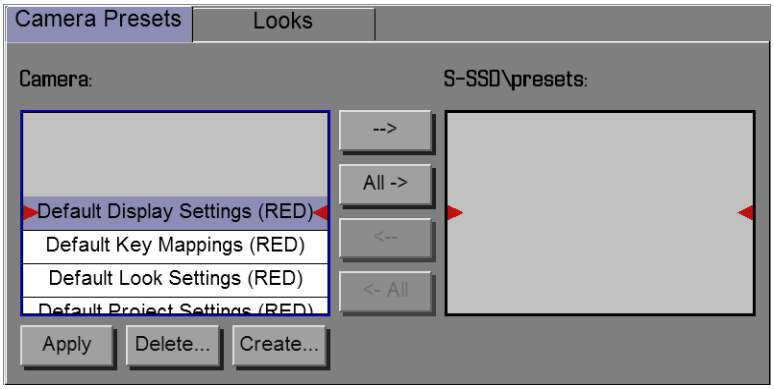
- Select ***Presets*** from the secondary menus
- Select the desired preset from the selection ribbon
- Press APPLY button
- Use the selection ribbon to selcet

Custom presets may be created to store groups of camera settings. For example; White Balance and ISO settings for a particular shooting location can be captured and as a preset and easily recalled later.

Presets can also be saved on an SSD and applied to other RED DSMC cameras.

CREATING A PRESET

- Select ***Presets*** from the secondary menus



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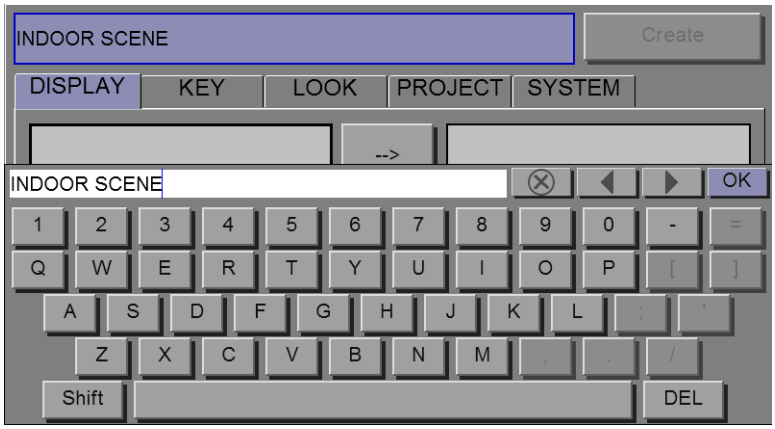
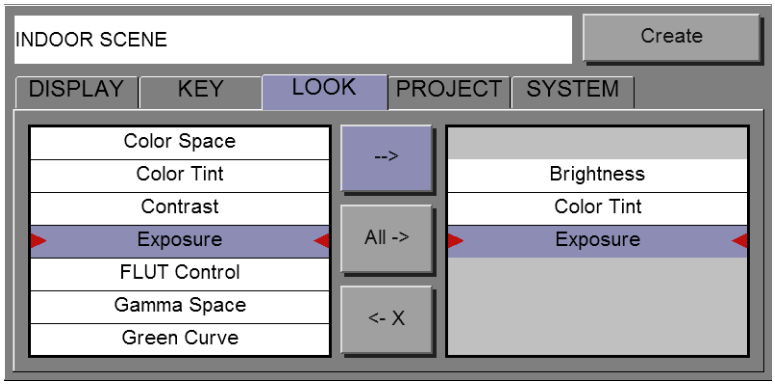
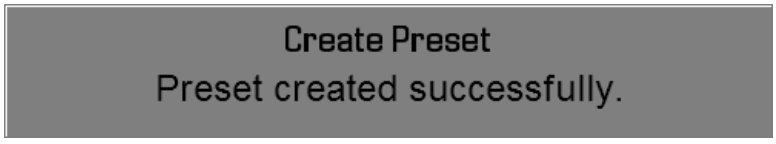
- Select ***Create*** and enter a name for the new preset using the QWERTY keyboard
- Press OK on keyboard to save the preset name



- Copy the desired settings from the left box of the interface to the right box using the ***select one*** (-->) or ***select all*** button



- Select and press ***Create*** button (upper right corner of the screen)



The preset has been created and is now stored on the camera.

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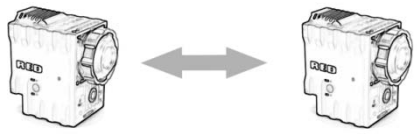
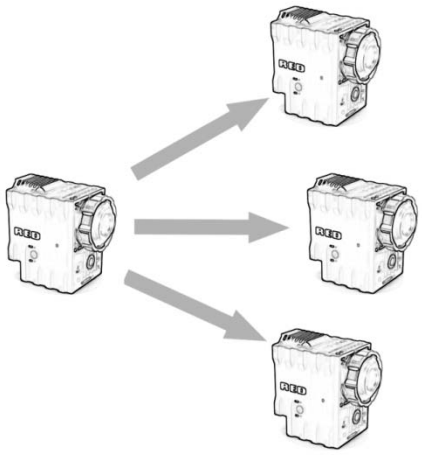
SHARING PRESETS

Presets may be shared between RED DSMC cameras using SSD media.

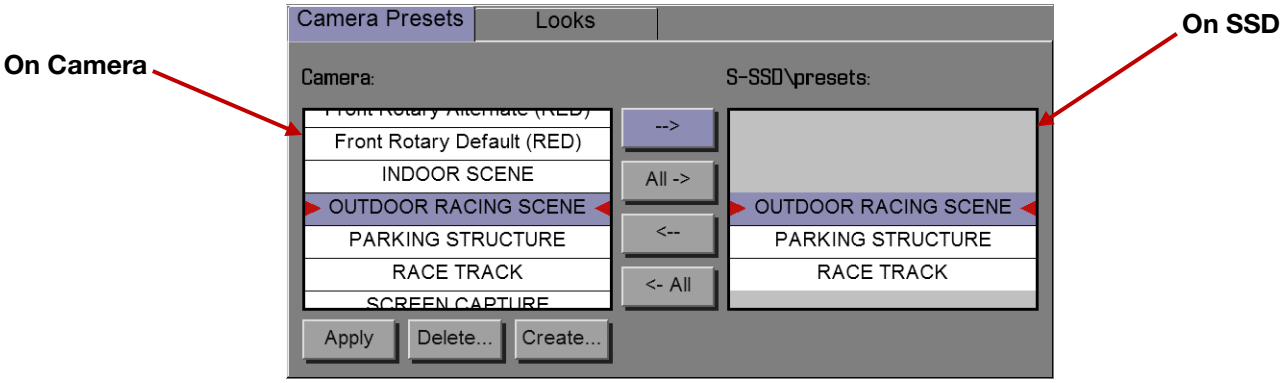


Camera to camera



Camera to multiple cameras

Select ***Presets*** from the secondary menu:



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COPY PRESETS FROM CAMERA TO SSD

- Use scroll ribbon to select desired preset in camera box
- Use --> button to move the preset to the SSD box

COPY PRESETS FROM SSD TO CAMERA

- Use scroll ribbon to select desired preset in SSD box
- Use --> button to move the preset to the Camera box
- The following window will appear

- Select ***Yes*** to copy the preset to the camera and apply the setting
- Select No to copy the preset to the camera without applying the settings

MANAGING PRESET FILES

- The APPLY, DELETE, and CREATE buttons are only affect the camera box. Presets on the SSD will remain there until the media is reformatted.
- Copy the desired settings from the ***S-SSD\Presets*** side of the interface to the ***Camera*** side using the ***select one*** (-->) or ***select all*** button

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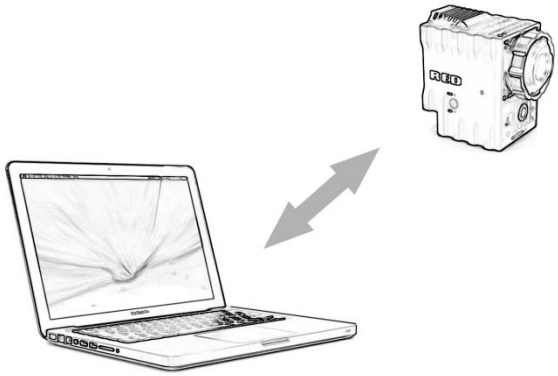
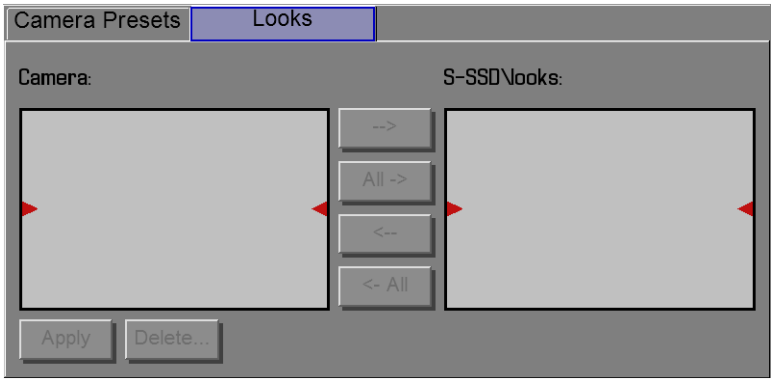
LOOKS PRESETS

Look Presets allows you to save the specific color, image, white balance, and detail settings to be used for other projects. Meta is the default settings shot on the camera and cannot be deleted. As looks are created, they will be displayed alphabetically.



For detailed information on LOOKs, see the *REDCINE-X Operation Guide*, available on RED.com



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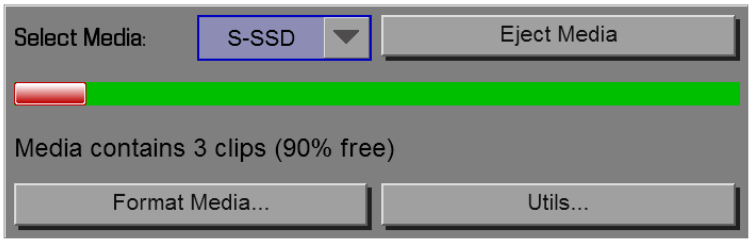
MEDIA MENU

The Media Menu is used to format media (SSD) prior to use on the camera as well as to Eject (unmount) the media prior to removal from the camera. Available options when selected are SELECT MEDIA, FORMAT MEDIA, EJECT MEDIA, and UTILITIES.

IMPORTANT: Media MUST be ejected from the camera before removal to prevent corruption and/or loss of data on media.

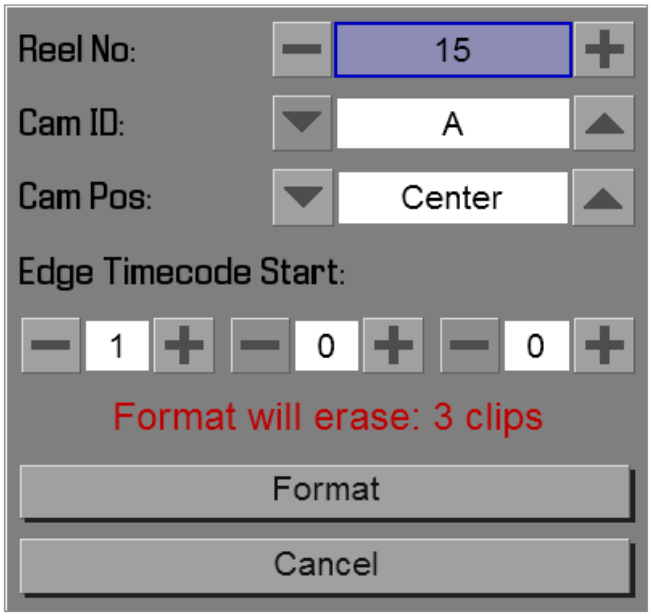


SELECT MEDIA

Allows you to select the Media location to be used by the camera. Default is the Side SSD (S-SSD) Module.

FORMAT MEDIA

When selected, a new dialog box will appear allowing you to add properties to the media highlighted in the Current Media box when formatting. Available options are REEL NO, CAM ID, CAM POS, and FORMAT to format the media with the values entered.



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NOTE: If clips are present on the media, you will be informed of how many clips will be erased when you format the media.

REEL NO.

When selected a keypad will appear allowing you to enter a value between 1 and 999.

CAMERA ID (SLATE)

Identifies the camera with a letter A through Z. Default is A.

CAMERA POS (POSITION)

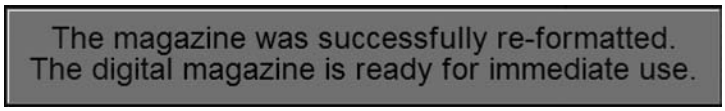
Identifies the camera position as Right, Left or Center. Default is Center.

FORMAT

When selected, formats the media and adds the selected properties.

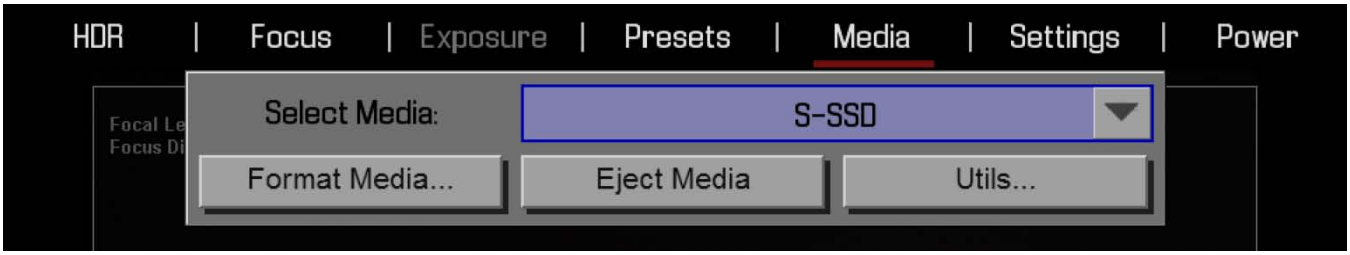
- During formatting, the camera will display "Formatting" with a Green status bar. REDMOTE will also display this message.

- When formatting is complete, camera will display "The magazine was successfully re-formatted. The digital magazine is ready for immediate use. REDMOTE will also display this message.



EJECT MEDIA

When selected will Eject (unmount) the media highlighted in the Select Media box.



When ejected, camera will display "Media Ejected Successfully". REDMOTE will also display this message.

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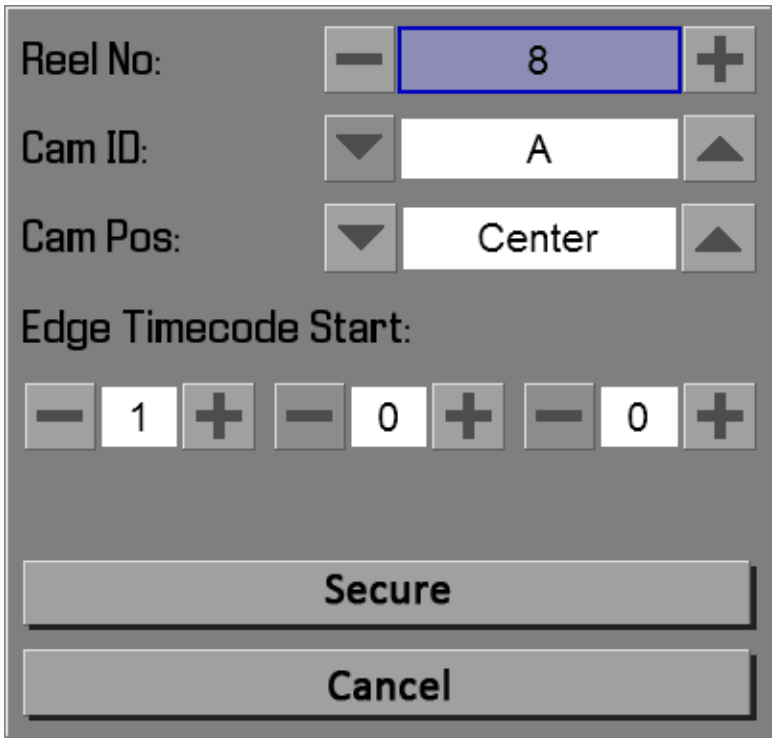
UTILITIES

Options are SECURE FORMAT.

SECURE FORMAT

Secure Format is a low-level format the rebuilds the SSD file system. It should only be used if the performance of the SSD is in question.



NOTE: If clips are present on the media, you will be informed of how many clips will be erased when you secure format the media.

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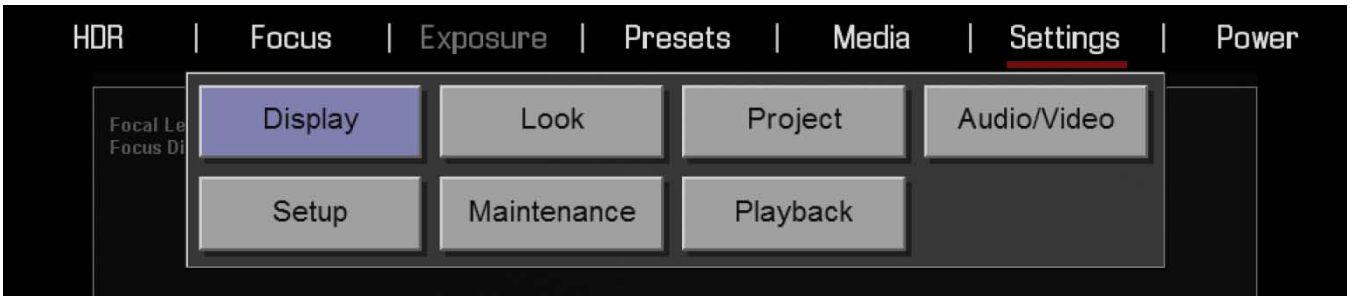
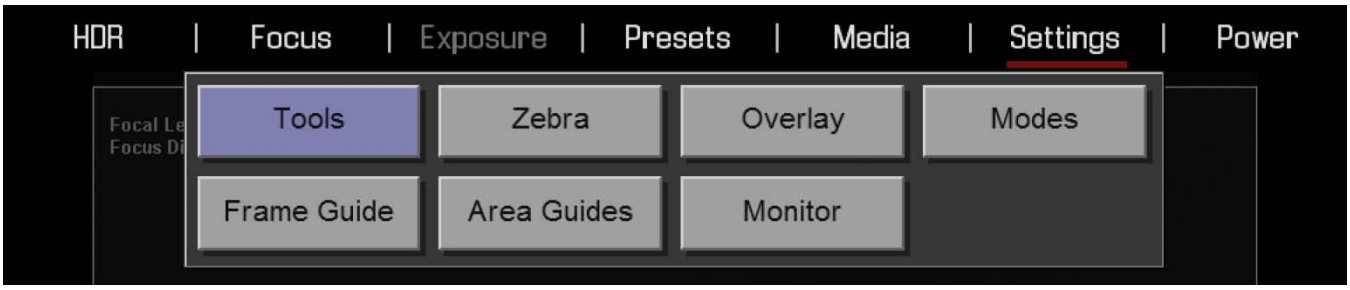
SETTINGS MENU

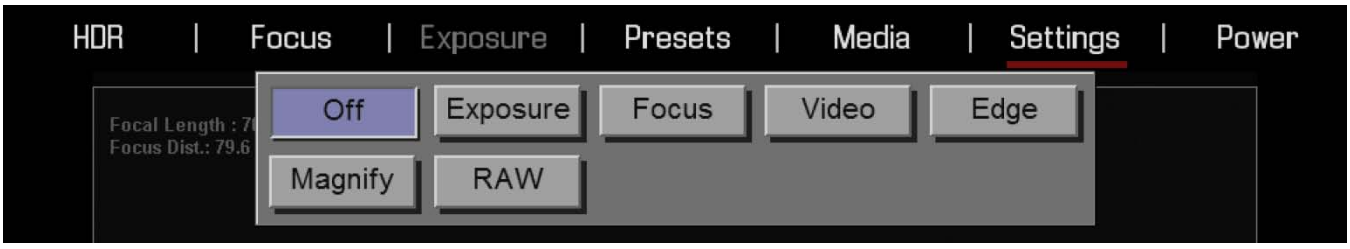
This section describes the various secondary controls available to configure the camera. Menu options are DISPLAY, LOOK, SENSOR, PROJECT, MODES, AUDIO/VIDEO, SETUP, MAINTENANCE, and PLAYBACK.



DISPLAY

Available options are TOOLS, ZEBRA, OVERLAY, MODES, FRAME GUIDE, AREA GUIDES, and MONITOR.

TOOLS

The Tools menu permits the operator to adjust the GUI elements displayed on the Viewfinder output(s) Available options are OFF, EXPOSURE, FOCUS, VIDEO, EDGE, MAGNIFY, and RAW. The Dialog is available by either going to SETTINGS > DISPLAY > TOOLS or simply clicking on the histogram in the lower left.



OFF

Turns off any of the display modes in the first line.

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EXPOSURE

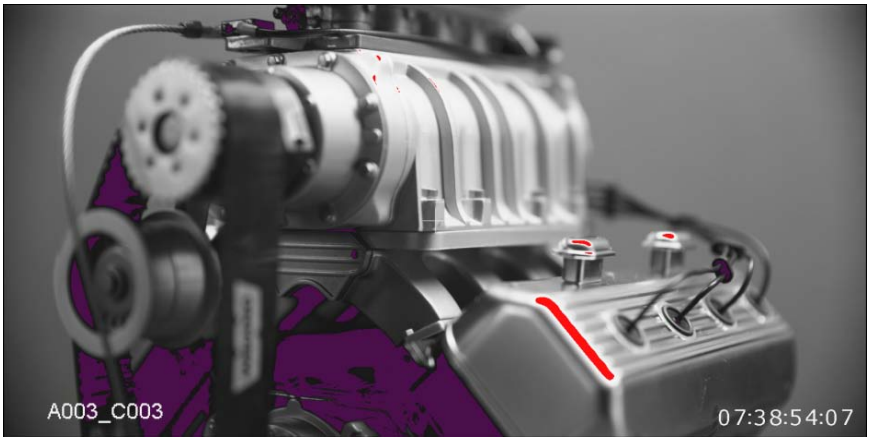
This will show areas of under exposure (Purple) or over exposure (Red) on top of a monochrome image. The color is based on RAW data so over/under exposure refers to data actually close to clipping in the sensor. When selected, the icon "E√" will be displayed in the Lower Status Group.

The EXPOSURE meter's color bands provide the following information:

PURPLE	Minimum Exposure
RED	Maximum Exposure

Between minimum and maximum exposure values, the image is displayed as a monochrome image.

In the image, Purple areas represent sensor exposure levels that are likely to be noisy if gained up in post-production. Red areas represent sensor exposure levels that are at clipping.



NOTE: As EXPOSURE meters sensor RAW information, it is not affected by any RGB domain adjustments - such as ISO rating, FLUT, White Balance, Video Gain or other LOOK information.

NOTE: Because the RAW data represents a wider color space than RGB, provided that the Red (clip) color is not present in EXPOSURE view, even if Red (clip) color is present in VIDEO view, the apparently clipped RGB highlights can be recovered in post-production by adjustment of ISO, FLUT or changing the KNEE and WHITE values of the CURVE box.

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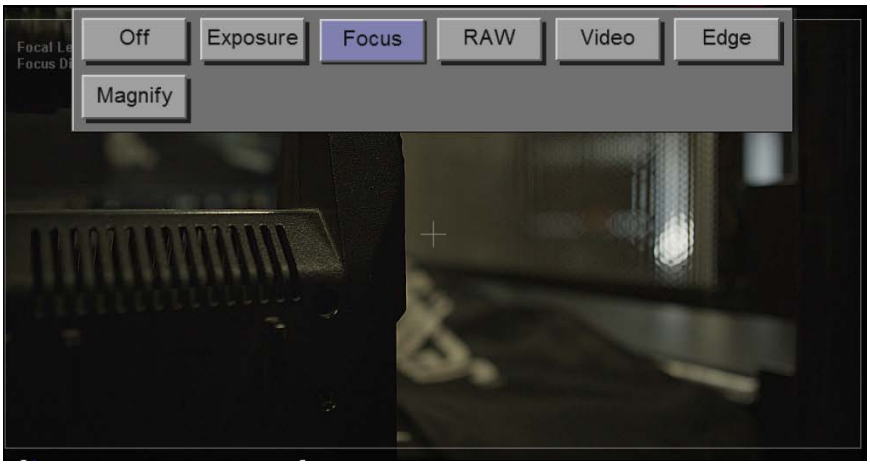
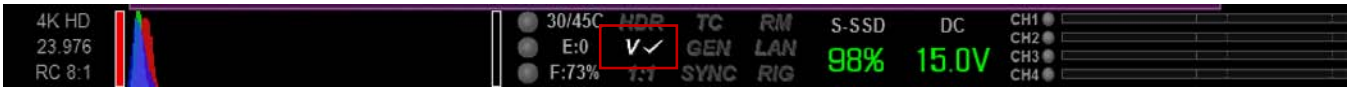
FOCUS

This will emphasize edges in the image without changing brightness/image content so it is easier to judge if the image is in focus. By adjusting your lens zoom and focus you can see which objects are coming into and falling out of focus. When selected, the icon "F√" will be displayed in the Lower Status Group.



VIDEO

VIDEO displays a multi-color color overlay that allows you to check the video level of the RGB monitor path (calibrated to the SMPTE test signal) and any outputs driven from that path - such as HD-SDI and HDMI. When selected, the icon "V√" will be displayed in the Lower Status Group.



Purple represents Super-Black, Dark Blue represents Black, Teal represents 3-stops under 18% Gray, Green represents 18% Gray, Pink represents Skin Tone, Straw represents White, and Yellow, Orange and RED represent various degrees of signal clipping in RGB space.

By adjusting ISO, FLUT and Shadow while looking at VIDEO check, the operator can ensure that Black, White and 18% Gray values conform to the desired levels on the HD-SDI and /or HDMI outputs.

The VIDEO bands provide the following information:

PURPLE	Super Black (IRE 1-0)
BLUE	Black (IRE 1-3)
TEAL	Dark Gray (IRE 9-12)
GREEN	Typical Level for 18% Gray Card (IRE 44-47)
PINK	Typical level for Caucasian Skin (IRE 54-57)
STRAW	White (IRE 96-98)
YELLOW	Super White (IRE 101-104)

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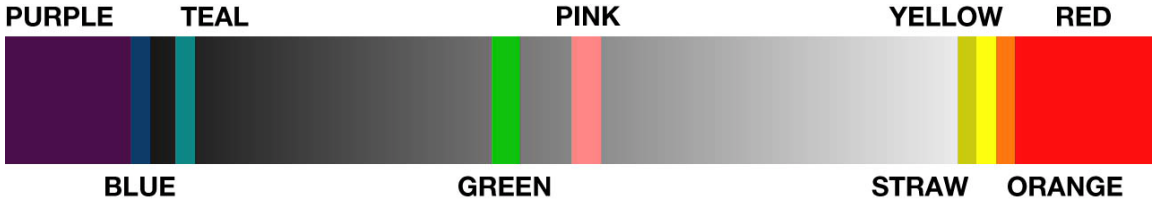
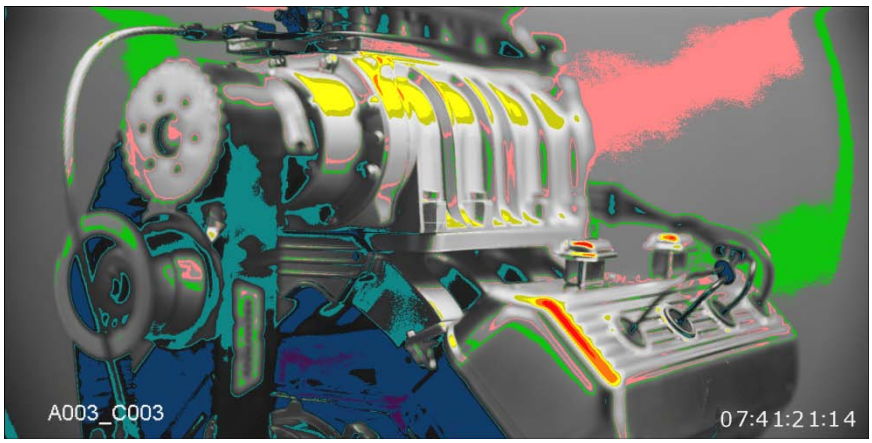
ORANGE	Super White (IRE 105-107)
RED	Super White (IRE 108-109)

At all other values, the monochrome image displayed represents the luminance value of the ISO adjusted image.

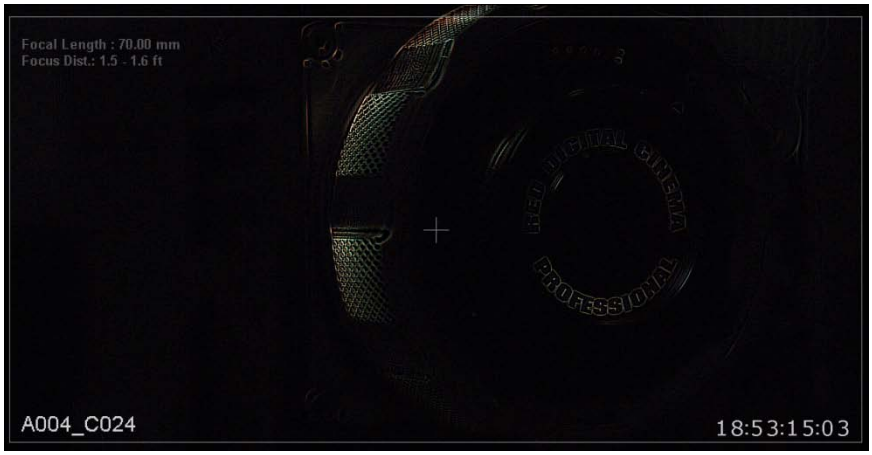




EDGE

EDGE displays a color overlay that outlines the edges of objects in an outline mode. By adjusting your lens zoom and focus you can pinpoint focus. When selected, the icon "F✓" will be displayed in the Lower Status Group.

WARNING: This will potentially interfere with recordings done via HDMI/HD-SDI in "Clean" Mode!



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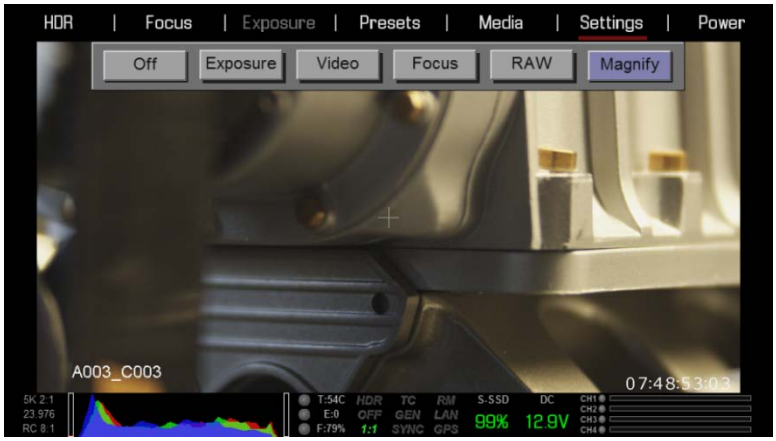
MAGNIFY

Magnify displays the central region of the sensor in 1:1 pixel resolution. When enabled, the 1:1 text in the Lower Status Group will change to Green. If in Magnify mode, when the Record button is pressed, the system will automatically exit this mode. When using a touchscreen you can also perform this function by pinching your fingers together and apart.

NOTE: HDR mode cannot be modified when in Magnify 1:1 mode.



NOTE: When in magnify mode, you will not be able to adjust frame rate or resolution. These options will be Grayed out.

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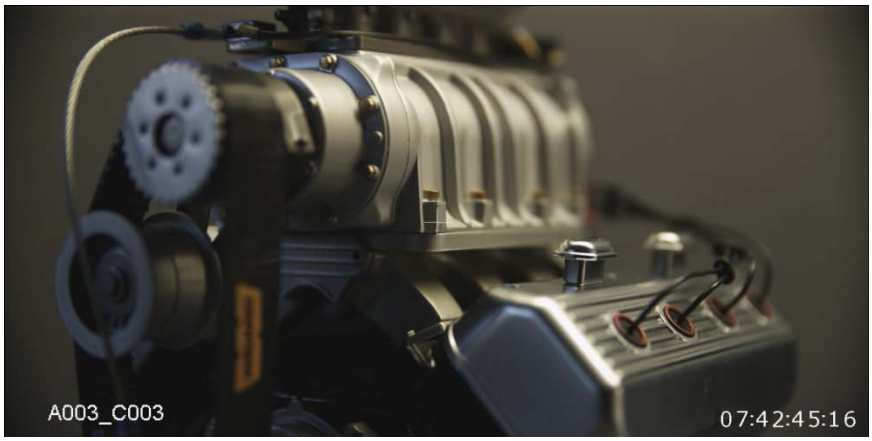
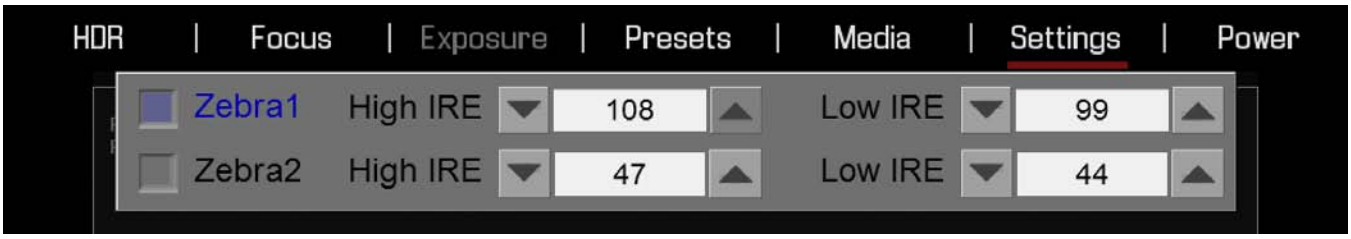
RAW

RAW displays the image without any ISO correction. When selected, OFF will be highlighted in the Lower Status Group.



ZEBRA

Zebras enable and adjust the upper and lower values for two independent Zebra indicators. One zebra may be used for highlight exposure, and the other for mid tone or shadows. Zebras will be visible when in 1:1 zoom. **By default, Zebra 1 and 2 are disabled.**



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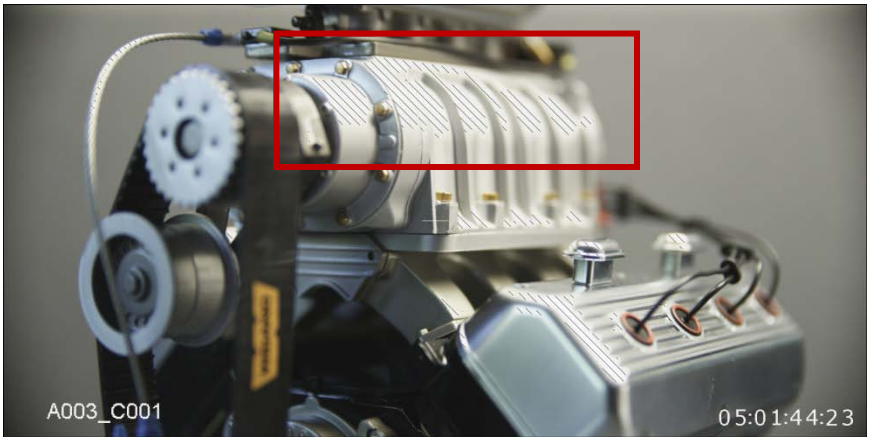
ZEBRA 1

To enable, select ZEBRA 1 check box. Areas of the image exposed within these ranges will be indicated by crosshatched overlays at - 45 degrees relative to vertical. Zebra 1 is shown in the image below.



High IRE

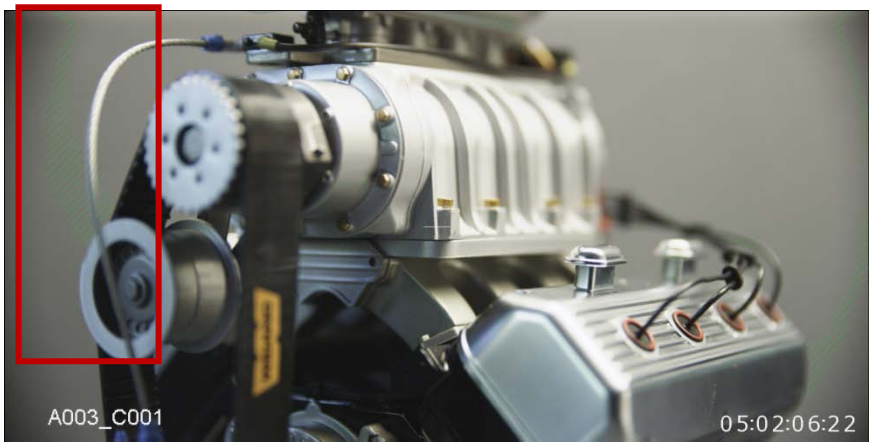
Change the desired setting between 93 and 109 (default is 108).

Low IRE

Change the desired setting between 75 and 107 (default is 99).

ZEBRA 2

To enable, select ZEBRA 2 check box. Areas of the image exposed within these ranges will be indicated by crosshatched overlays at + 45 degrees relative to vertical. Zebra 2 is shown in the image below.



High IRE

Change the desired setting between 1 and 99 (default is 47).

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Low IRE

Change the desired setting between 0 and 84 (default is 44).

OVERLAY

Allows you to enable and color code graphic overlays visible the on the Viewfinder and Preview outputs.

Use check boxes and pull down menus to control appearance of the overlays

Grid

The Grid display is shown below. The grid may be used as a “rule of thirds” indicator.

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Look Around

Highlights the look around area.

Overlay Elements

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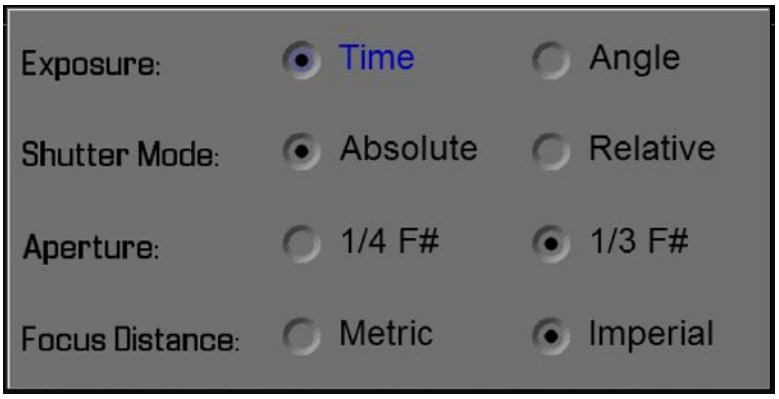
MODES

Available GUI display mode adjustments are Exposure, Shutter Mode, Aperture, and Focal Distance.



EXPOSURE

Selects GUI display of Shutter Exposure on Main screen as Time (1/xx sec) or Angle (Degrees). Default is Time. Angle is shown below.

SHUTTER

Enables one of two shutter timing (duration) modes: Absolute or Relative. Default selection is Absolute.

Absolute

Shutter Speed is defined exclusively by the Shutter Speed setting.

NOTE: When operating in Absolute mode, the shutter speed is reported in White text.

Relative

Shutter Speed is defined by the requested Shutter Speed divided by the ratio of the current capture fps to the Project TIME BASE fps.

NOTE: When operating in Relative mode, the shutter speed is reported in Yellow text.

NOTE: If the operator requests a shutter speed that is outside the capability of the camera, the camera will automatically limit them when a limiting parameter changes.

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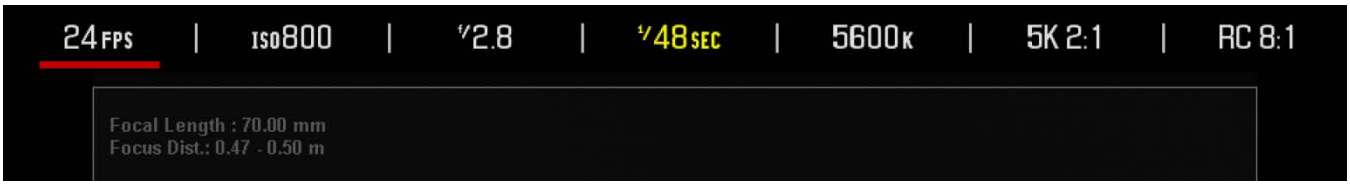
APERTURE

Selects GUI display of f/stop as 1/4 f Stop or 1/3 f Stop. Default is 1/3.

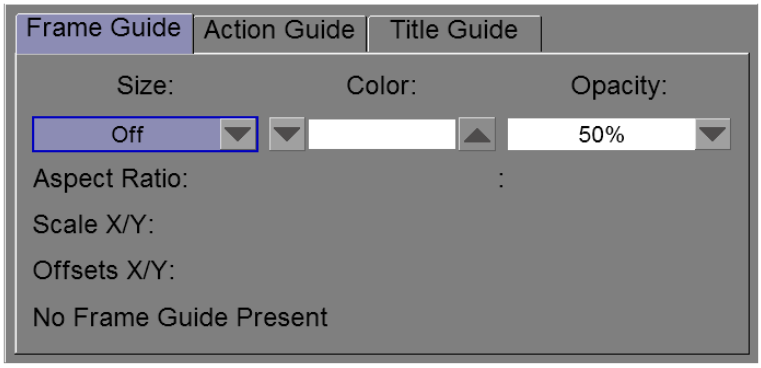
FOCAL DISTANCE

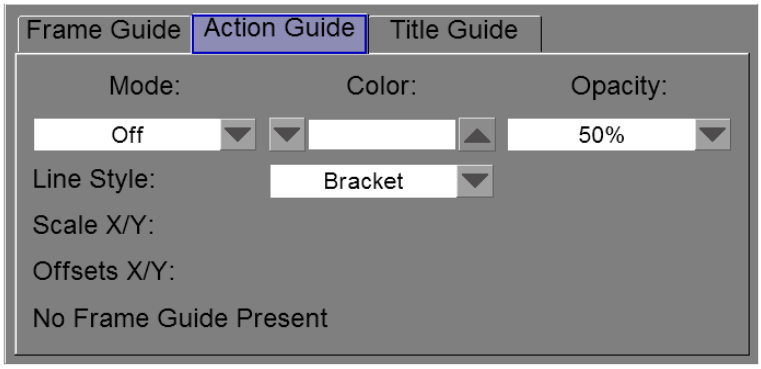
Allows you to set the Lens Info to display in Metric or Imperial measurements. Default is Imperial.



GUIDES

This sub-menu provides a selection of frame guides and safe action and safe title guides. User definable safe action and safe title guides may be saved as a USER PREFERENCE, thereby permitting the camera guides to be fully customized for any application. Available options are Size, Line Style, Color and Transparency.





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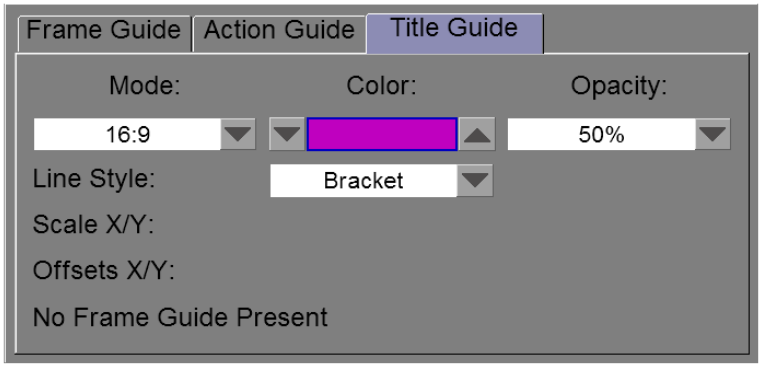


SIZE

Available options are Off, Full, 4:3, 16:9, 1.85:1, 1.9:1, 2.4:1, or User.

LINE STYLE

Available options are Solid, Dashed, or Bracket.

COLOR

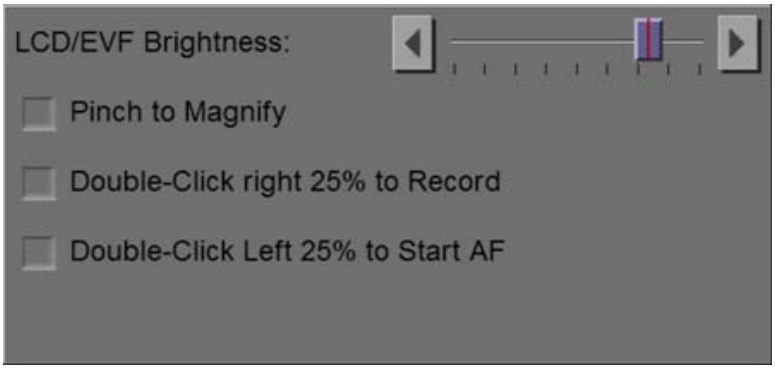
Sets the frame guideline color to White, Gray, Teal, Purple, Yellow, Green, Blue, Red, or Black. Select the color that provides maximum color contrast with the scene you are shooting. Default is White.

TRANSPARANCY

Sets the frame guide transparency. Available options are 0%, 25%, 50%, 75% and 100%.

MONITOR

Allows you to modify brightness of the LCD and EVF parameters through Brightness Control. Also allows options for the LCD touchscreen to be changed through Touch Gestures.



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BRIGHTNESS CONTROL

Slide to the right for a brighter display; slide to the left for a dimmer display.

TOUCH GESTURES

These options apply ONLY to the Touchscreen LCD.

Pinch to Magnify

When selected, allows you to use two fingers in a pinching motion on the screen to enable Focus Zoom. To zoom out to normal view, slide fingers apart.

Double-Click Right 25% to Record

When selected, the right 25% of the screen can be double-tapped to start and double-tapped again to stop recording.

Double-Click Left 25% to Start AF

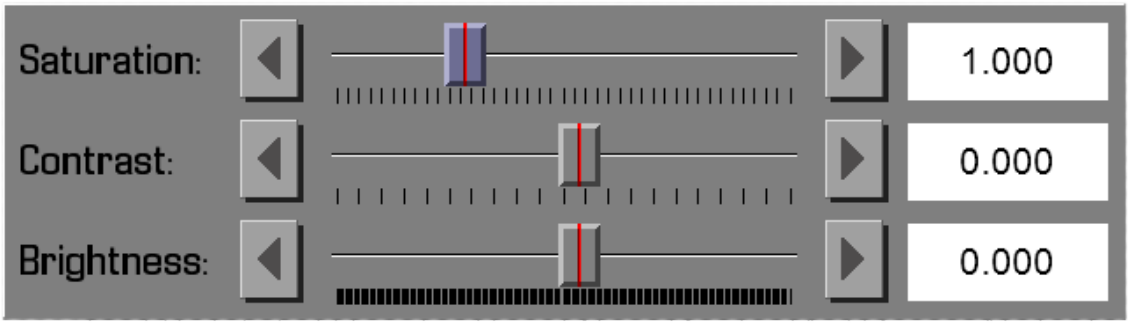
When selected, the left 25% of the screen can be double-tapped to start the Auto focus (when DSMC Canon Mount and compatible lens are installed).

LOOK

The LOOK menu permits adjustment of COLOR, GAIN, FLUT®, and CURVE metadata values. These parameters will affect the look of the monitor path, but do not affect the actual REDCODE RAW data being recorded.

COLOR

The Color sub-menu permits adjustment of SATURATION, CONTRAST, and BRIGHTNESS.



SATURATION

Adjusts color saturation. Range is 0.0 (monochrome) to +3.8 (super color). Default is 1.0.

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CONTRAST

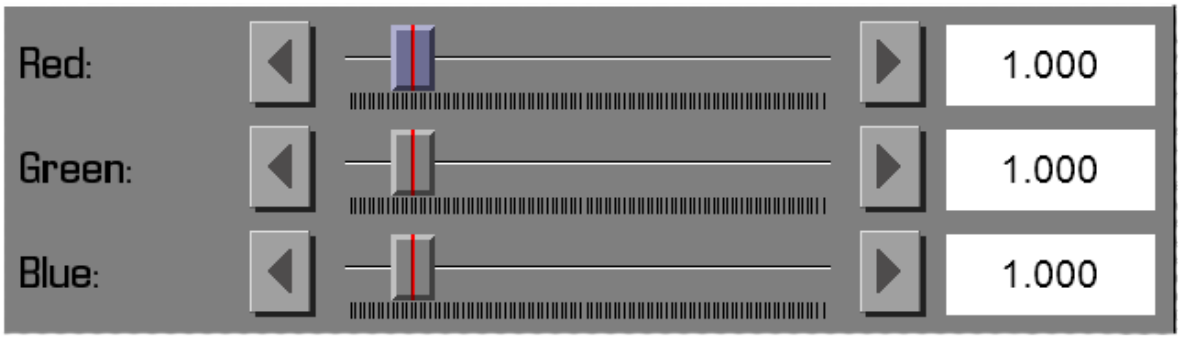
Adjusts the overall contrast of the image. Range is -1.0 (flat) to +1.0 (max contrast). Default is 0.0.

BRIGHTNESS

Adjusts brightness without crushing highlights. Available range is – 10.0 to +10.0. Default is 0.0.

GAIN

The GAIN sub-menu permits adjustment of RED GAIN, BLUE GAIN and GREEN GAIN.



RED

Adjusts the gain of the RED channel only. Range is 0.0 (no Red) to 10.0. Default is 1.0.

BLUE

Adjusts the gain of the BLUE channel only. Range is 0.0 (no Blue) to 10.0. Default is 1.0.

GREEN

Adjusts the gain of the GREEN channel only. Range is 0.0 (no Green) to 10.0. Default is 1.0.

FLUT

The FLUT sub-menu permits adjustment of FLUT, EXPOSURE COMPENSATION and SHADOW.

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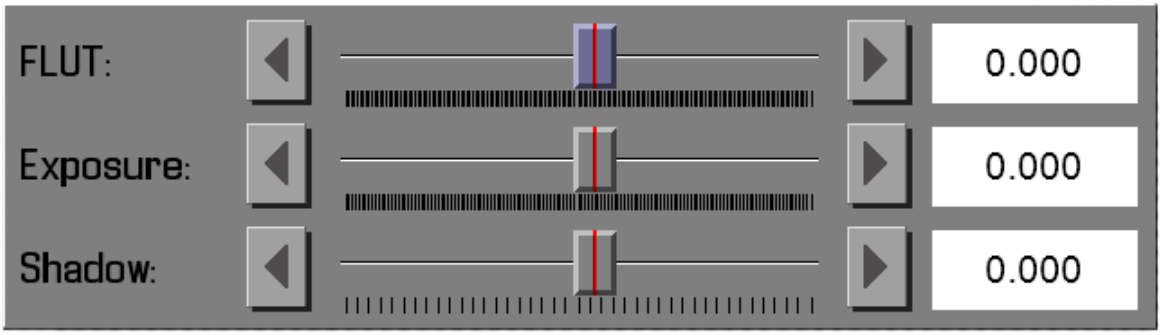


FLUT

FLUT (Floating Point Lookup Table) adjusts mid-range tone values. Range -8.0 to +8.0. Default is 0.0.

EXPOSURE

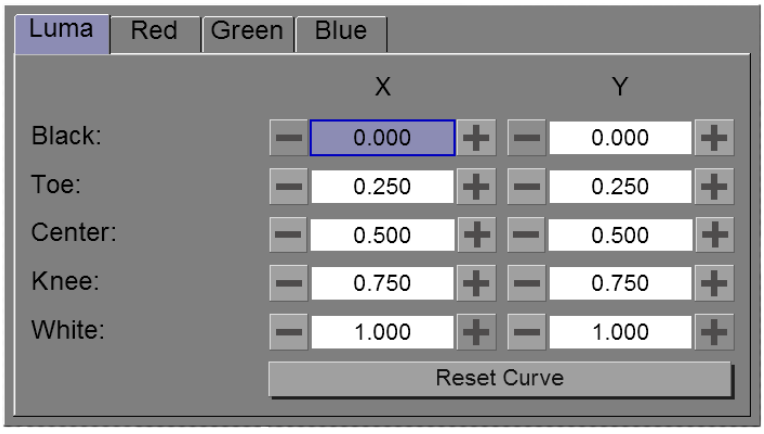
Adjusts exposure compensation. Available exposure range is –7.0 to +7.0. Default is 0.0.

SHADOW

Shadow adjusts the toe value of the FLUT or in other words, the tone near Black. Range is -2.0 to +2.0. Default is 0.0. Increasing the Shadow value raises the video level of near Blacks. Lowering the Shadow value crushes the video level of near Blacks.

CURVES

The curves dialog box allows the user to set define curves for Luminance, and the red, green, and blue channels.



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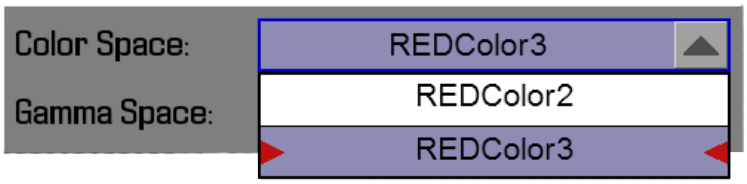
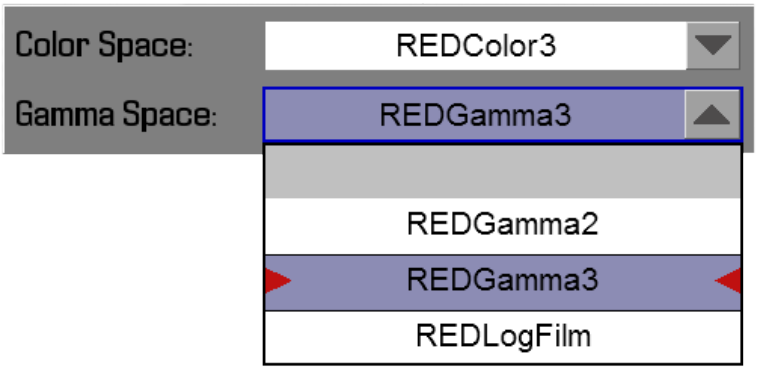
COLOR/GAMMA

The COLOR/GAMMA sub-menu permits adjustment of the monitor output Color Space and Gamma curves.



Available Color Space Options



Available Gama Space Options

PROJECT

The project menu sets the operating parameters the camera will use for a given project. Options available are TIME BASE and TIME CODE.

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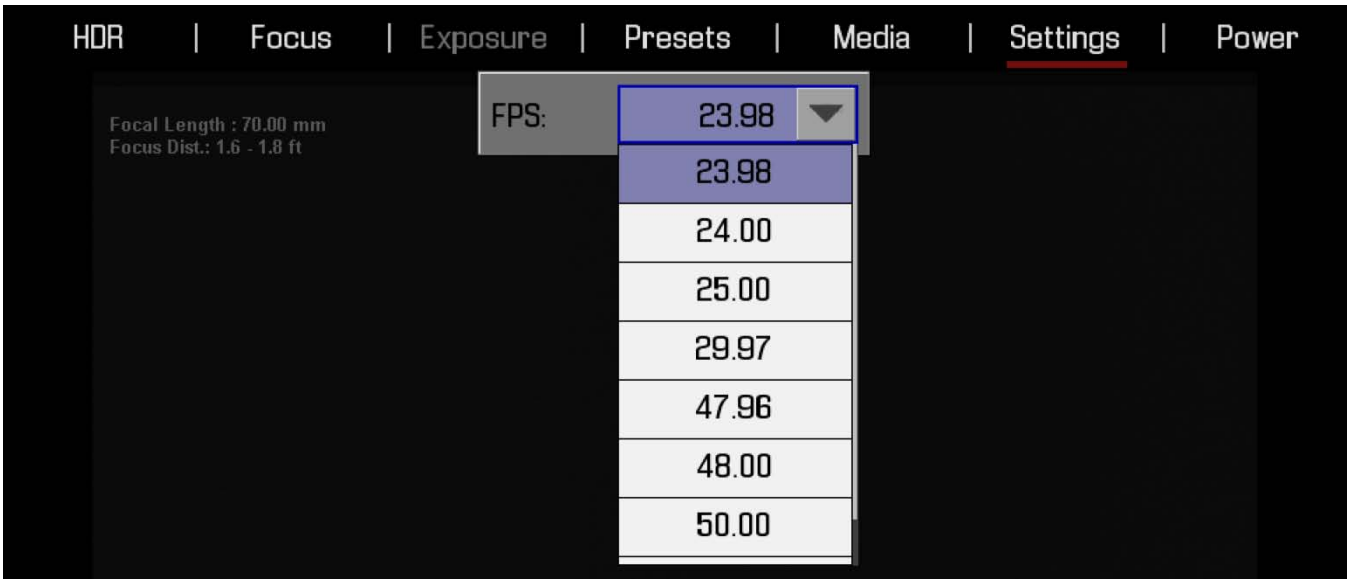
TIME BASE

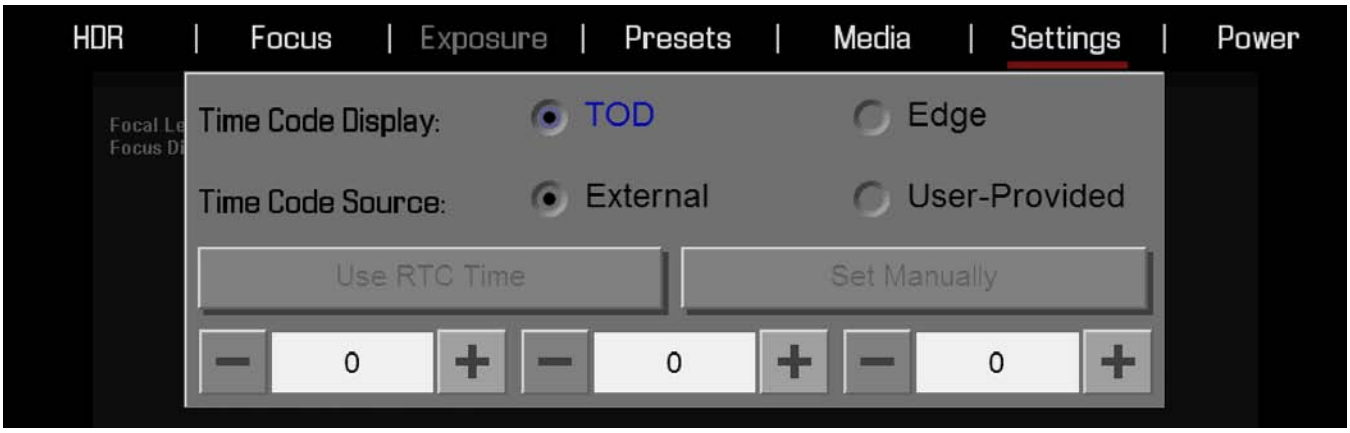
Sets the TIME BASE (fps) to be used for the project - the primary acquisition frame rate, time code count and playback & editing frame rate. Setting is displayed in the lower left corner of VIEWFINDER output(s).

Available options are 23.98, 24.00, 25.00, 29.97, 47.96, 48.00, 50.00, and 59.94. Default is 23.98.



TIME CODE

Selects the TIME CODE source to be used. Options are EXTERNAL TC and INTERNAL USER-PROVIDED TC.



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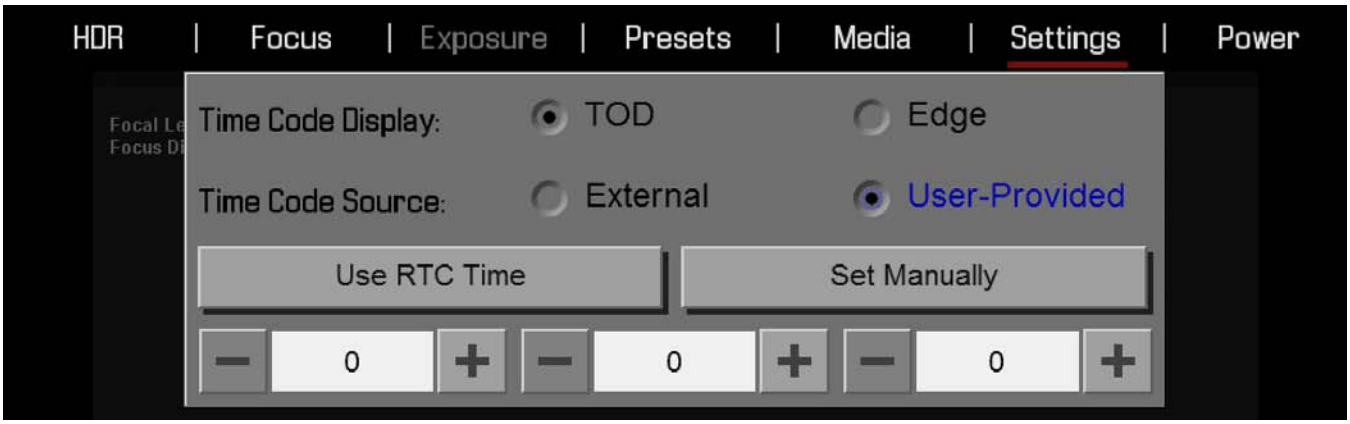
TIME CODE DISPLAY

Allows you to choose between TOD and Edge display.

TIME CODE SOURCE

Available options are EXTERNAL and USER-PROVIDED.



User-Provided

The three numerical boxes below allow you to set hours, minutes and seconds (in that order).

Use RTC Time

When selected the camera uses the cameras Real Time Clock as the timecode counter source (snapshot of the RTC.)

Set Manually

When selected allows the user to define a custom value as the timecode counter seed.

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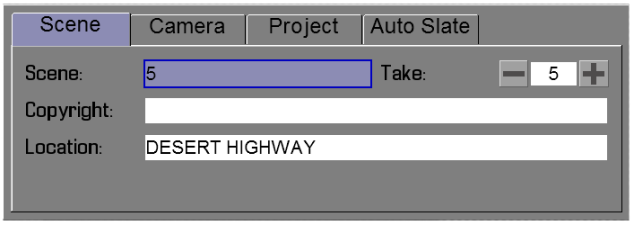
SLATE

When selected, a new dialog box will appear allowing you to add properties to the media highlighted in the Current Media box when formatting. Available options are CAM ID, CAM POS and SET to set the values entered.

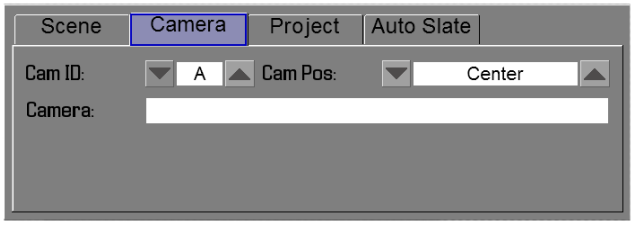
Auto-Incrementing Take

If there is a value entered in the Scene box, the camera will automatically increment the take number every time the camera starts and stops recording.

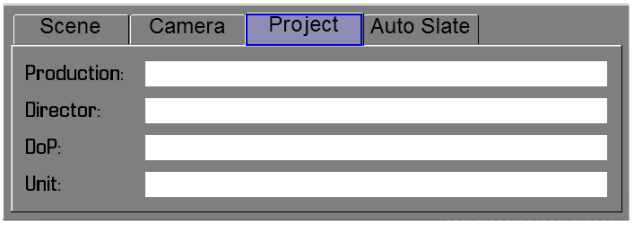
Note: The scene name is limited to eight characters.



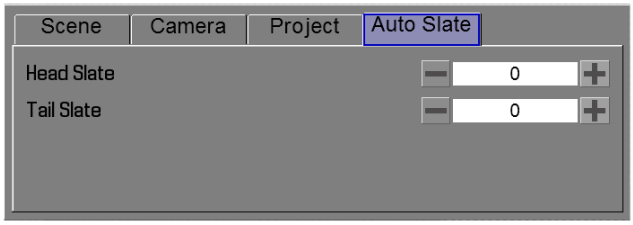
Scene Information



Camera Information



Project Information



Auto Slate Information

SYSTEM STATUS

Selecting System Status from the Project menu displays key project information.

System Configuration			
Format	5K 2:1	ISO	800
Timebase	23.976	Kelvin	4500
REDCode	5:1	Tint	0.000
Varispeed	23.976	Flut	0.000
TC Track	- - -	Genlock	None
TC JAM	OFF	Cam Name	A
Rig Metadata	- - -	Cam Pos	Center
Sensor Sync	None	Calibration	37C,1/42Sec
Color Space	REDColor3	Gamma Space	REDLogFilm

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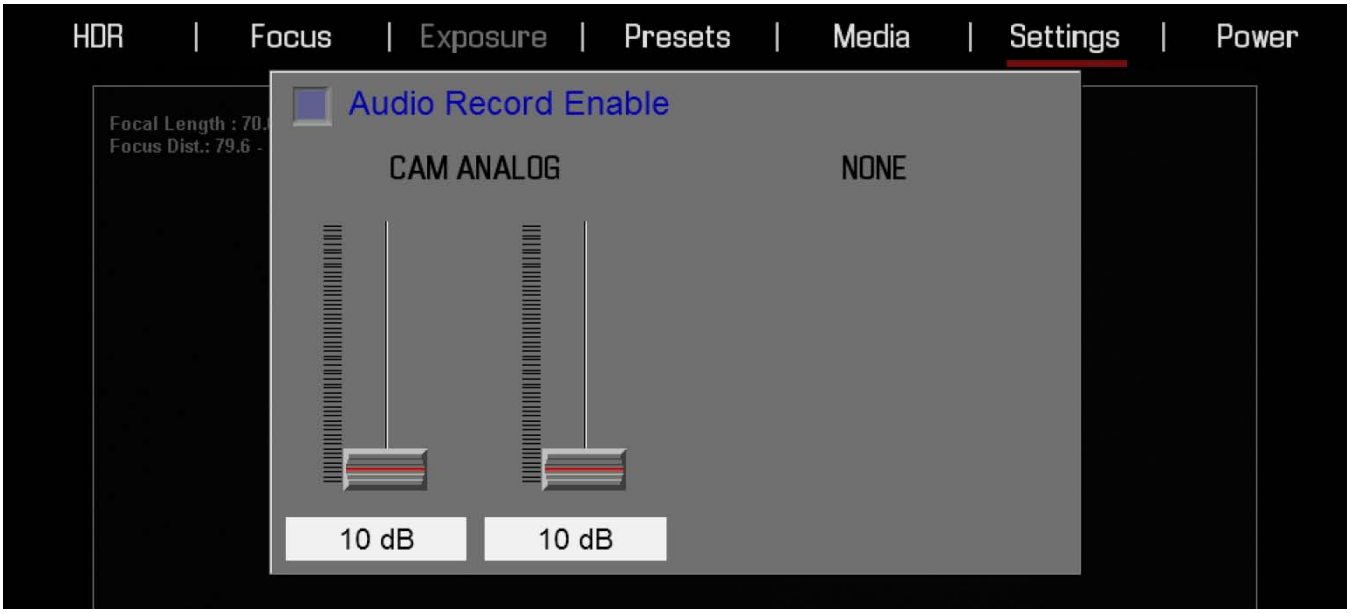
AUDIO/VIDEO

Menu adjusts AUDIO INPUT, AUDIO OUTPUT, AUDIO CHANNELS, MONITOR CONTROL, and TEST SIGNALS.

AUDIO INPUT

Allows you to enable / disable and adjust levels for audio inputs (CAM ANALOG). Default is unchecked. Range 8 to 64 dB, default is 10 dB.



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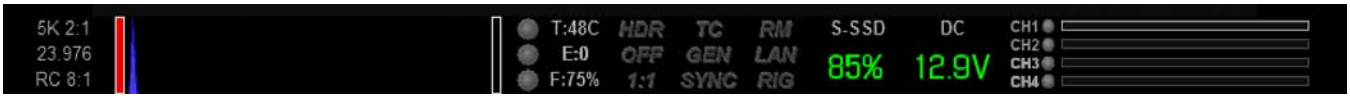
You can also directly input your desired audio levels.

Audio channel level inputs are displayed in the lower section of the UI.

When audio is enabled and an audio jack is plugged in (detected by the camera), the circle next to CH1, CH2 etc… will be Green and the box around the signal will be highlighted.

When audio is enabled and an audio jack is not plugged in (not detected by the camera), the circle will be Red.

Also, when audio is disabled and an audio jack is plugged in, the circle will remain Gray but the box around the signal will be highlighted (jack is detected by the camera).



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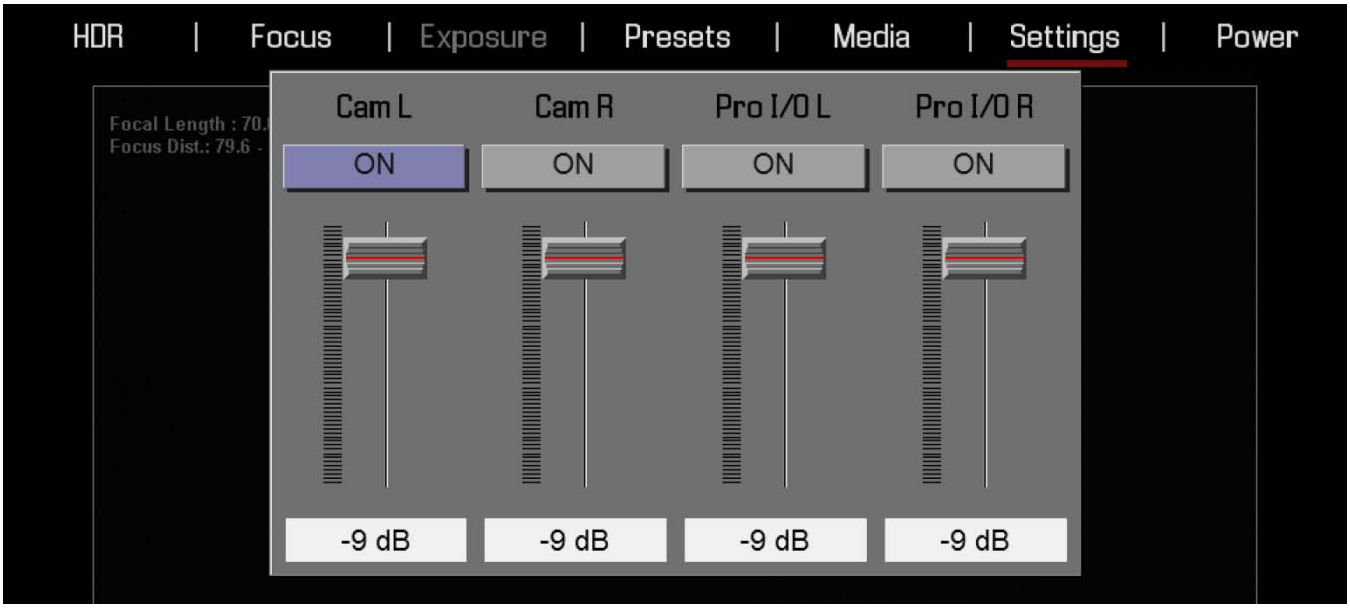
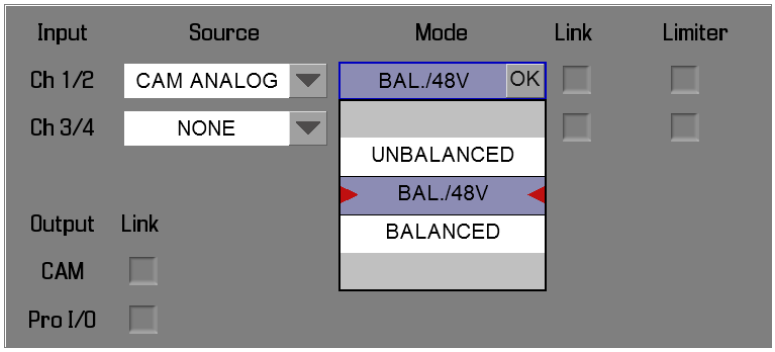
AUDIO OUTPUT

Allows adjustment of audio output levels fed to the outputs. Available options for each channel are ON and MUTE. Default is ON at -9 dB.



AUDIO CHANNELS

Allows selection of audio inputs and operational modes.



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INPUT

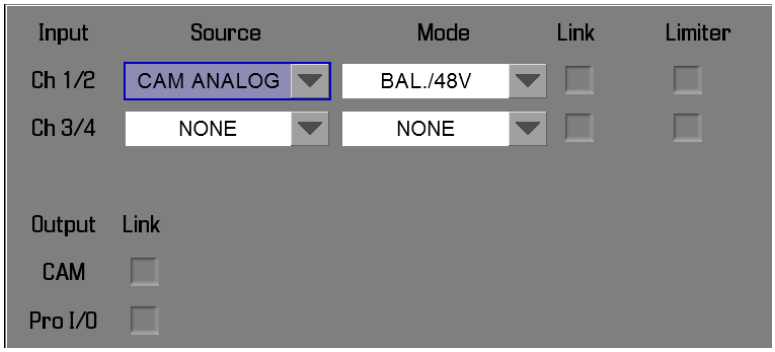
Available inputs are CH 1/2 and CH 3/4.

NOTE: For cameras not equipped with a PRO I/O module, options are CH 1/2.

Source

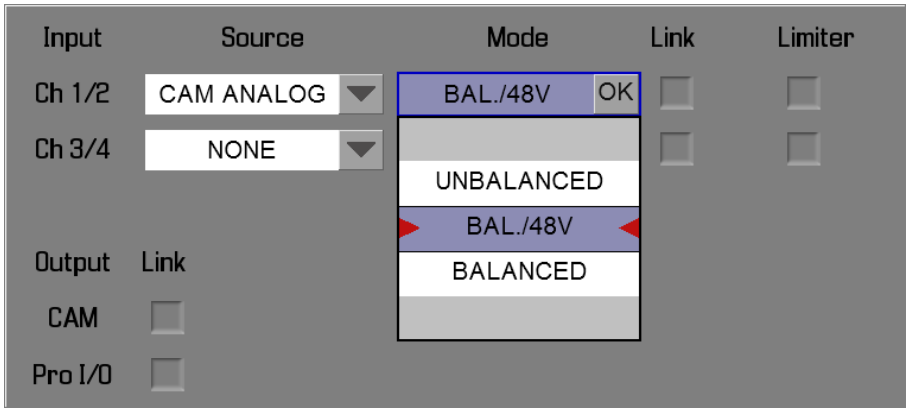
Available options are NONE, CAM ANALOG, PRO I/O ANALOG, PRO I/O AES A, and PRO I/O AES B.

NOTE: For cameras not equipped with a PRO I/O module, options are NONE or **CAM ANALOG.**



Mode

Available options are UNBALANCED and BALANCED.



Link

Enables linkage between Channel Gain controls.

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Limiter

Enables signal limiter circuit. Limiter enabled adds 10dB of headroom for Microphone level inputs, or 4dB for Line Level inputs.

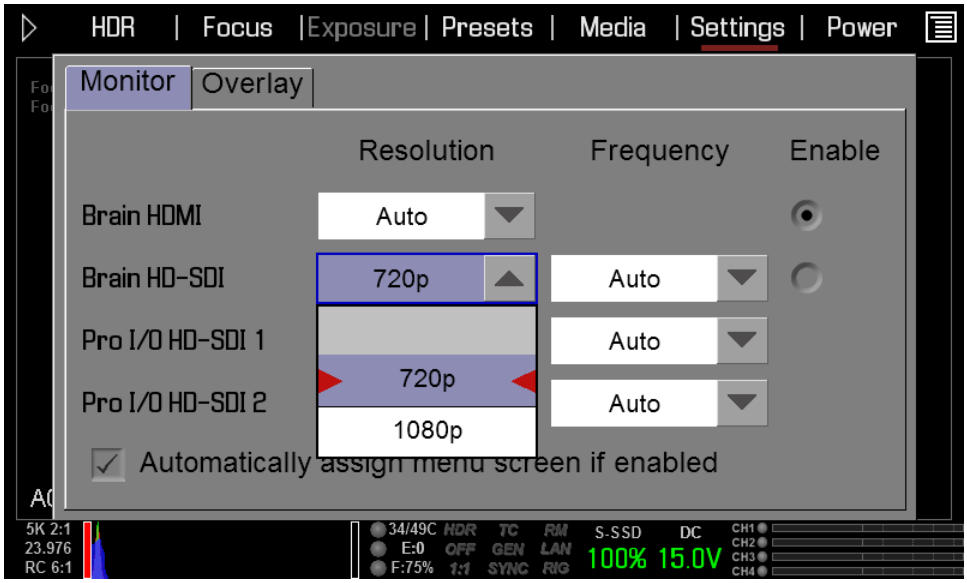
OUTPUT

Link

Enables linkage between Output Channel Attenuation controls.

MONITOR CONTROL

This sub-menu allows the monitor outputs settings to be modified. For changes to take effect, the camera MUST be restarted.



MODE

Allows you to choose the output for the LCD/EVF, HDMI and HD-SDI monitors.

LCD/EVF

Options are MENUS, PREVIEW, CLEAN, OVERLAY, 3D LEFT, and 3D RIGHT.

If anything other than MENUS is selected on the LCD (such as CLEAN), to return to displaying the MENUS, perform a double-tap on the LCD screen.

HDMI

Options are OFF, MENUS, PREVIEW, CLEAN, OVERLAY, 3D LEFT, and 3D RIGHT.

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RES

Allows you to choose the output resolution for HDMI monitors. Available options are AUTO, 720p and 1080p.

NOTE: Some HDMI monitors may have trouble when "AUTO" is selected. In these cases, it is recommended to manually select the maximum monitor resolution provided.

HD-SDI

Options are OFF, MENUS, PREVIEW, CLEAN, OVERLAY, 3D LEFT, and 3D RIGHT.

RES

Allows you to choose the output resolution for HD-SDI monitors. Available options are AUTO, 720p and 1080p.

FREQ

Allows you to choose the output frequency in Hertz (Hz) for HD-SDI monitors. Available options are AUTO, 23.976/24, 25, 29.976, 47.952/48, 50, and 59.94.

AUTOMATICALLY ASSIGN MENU SCREEN IF ENABLED

When checked will assign an attached external monitor to display the menus if none are selected.

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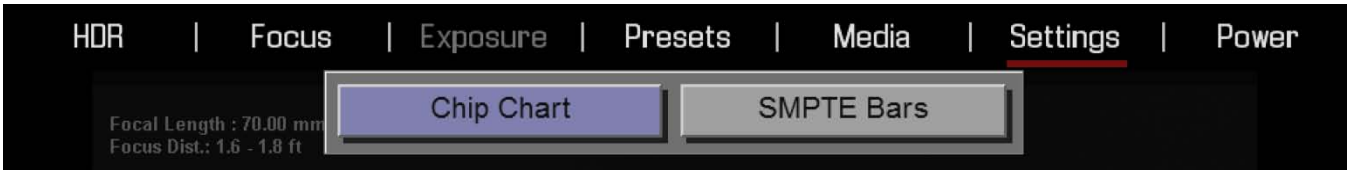
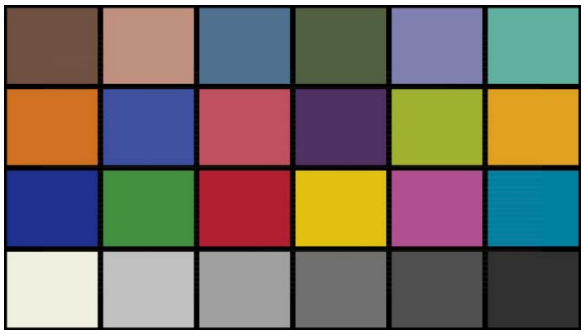
TEST SIGNALS

Permits the video monitor outputs to be replaced with a video test pattern. Available test patterns are CHIP CHART and SMPTE BARS.



To enable a desired test signal, select the desired test signal box. To exit the test signal, tap the touchscreen one time or press the Enter or Menu button on the Side Handle or REDMOTE.

CHIP CHART	SMPTE BARS
	

NOTE: RED DSMC test signals are not recordable, they are provided to help align external video monitors connected via the HD-SDI or HDMI outputs.

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SETUP

This menu permits a variety of system setup tasks to be accomplished. Options available are KEYS / SHORTCUTS, DATE / TIME, NETWORK, SERIAL, REMOTE, GPIO, and SYSTEM.

KEYS

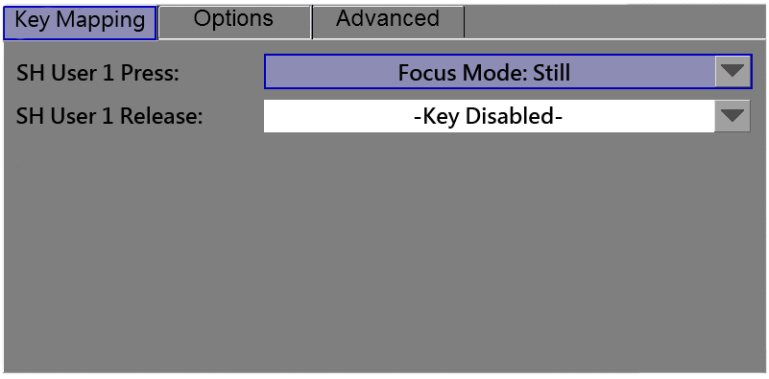
Use Keys function to customize the assignment of DSMC camera controls.

KEY MAPPING

With Key Mapping, you press the button you want to change and follow on-screen instructions to complete the change.

When the Key Mapping tab is highlighted:

- Press the camera key you want to change.
- Use the pull down to select the desired function
- Press menu or a blank area of the touchscreen to save the setting



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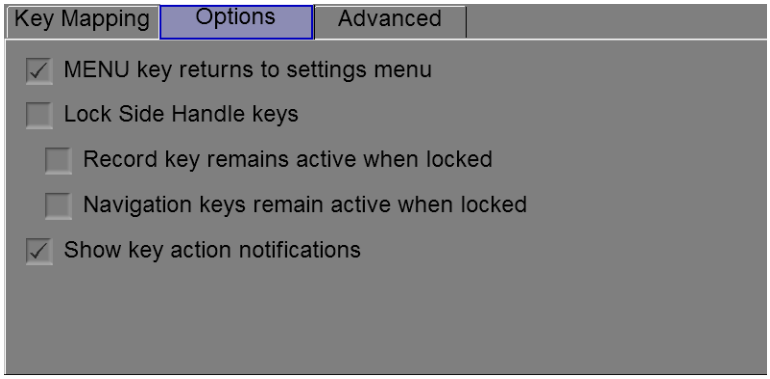
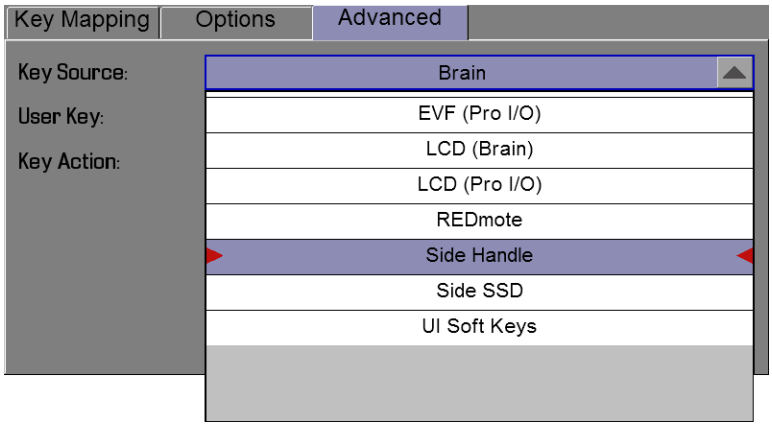
OPTIONS

- Select the desired option
- Press menu or a blank area of the touchscreen to save the setting



ADVANCED

- The advanced tab allows you to set key functions using a series of pull down menus
- Select Key Source (Brain, REDMOTE, Side SSD, etc.)
- Select the key you wish to change
- Select the desired key action



Key Source

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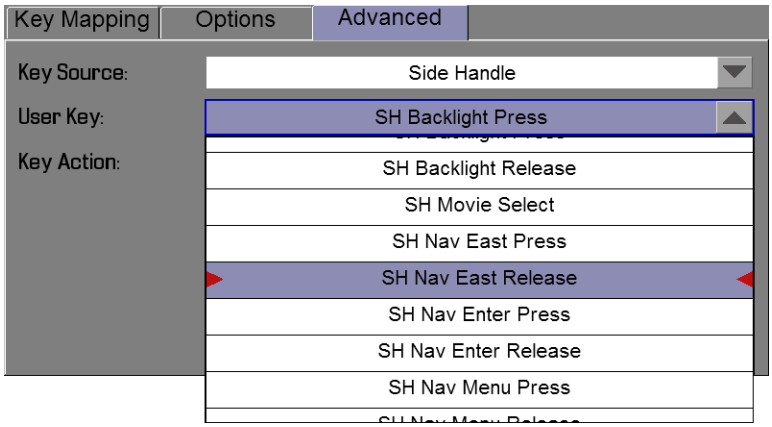
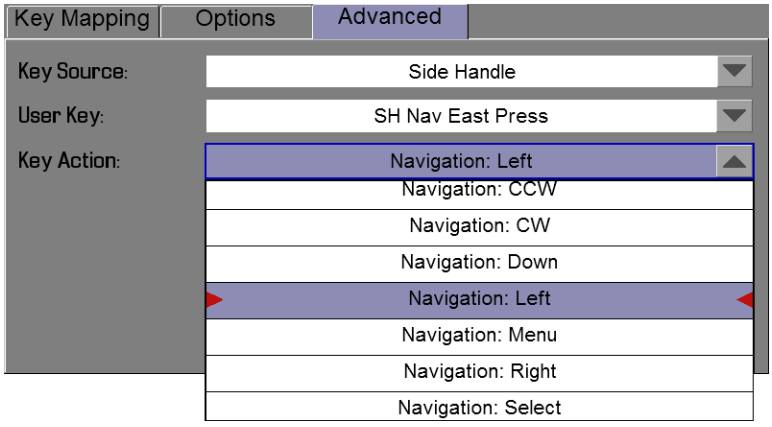


User Key



Key Action

WARNING: Do not remap the navigation keys (Up, Down, Left, Right, Select (Enter), or Menu) on the side handle doing so could render the camera inoperabel.

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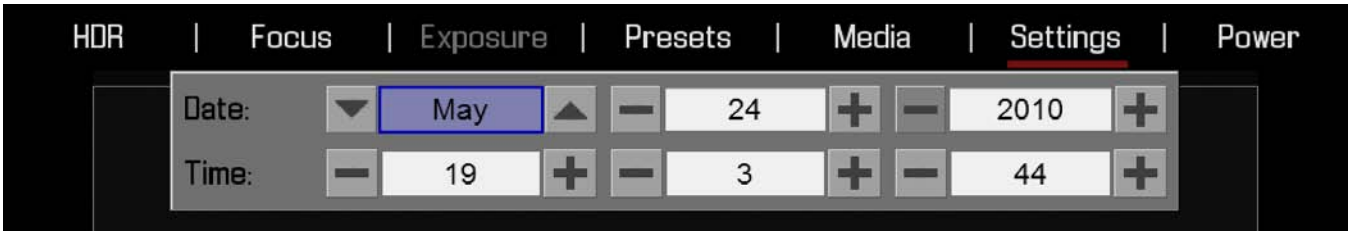
DATE / TIME

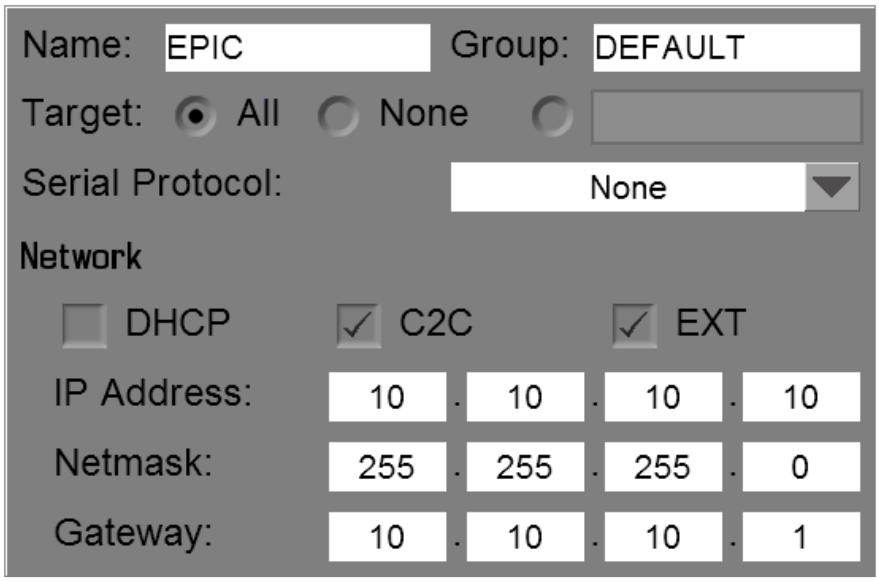
This menu allows the user to reset the battery backed up internal clock of the camera. This time value is used as a timestamp on the .R3D files when recording to the RED MAG 1.8" SSD media.



NOTE: Enter time in 24-hour clock format. i.e. 2:35 pm should be entered as 14:35:00.

COMMUNICATION

Communication Menu allows you to set a unique identification for the camera (or a group of cameras) when operating in command and control communications network. Parameters are NAME, GROUP, TARGET, set a SERIAL PROTOCOL, ENABLE DHCP, C2C or EXT, IP ADDRESS, NETMASK and GATEWAY. Using the serial port or a direct Ethernet interconnect, two cameras, or one camera and one external device can be connected. If the camera is connected via Ethernet to a hub or router, multiple cameras and devices can communicate to each other.



NAME

Allows the user to create a unique camera NAME used in network communications

Note: the camera name field is limited to 8 characters.

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GROUP

A camera can also be identified as a member of a GROUP of devices. (For example, a group "3DRIG_A" could include two cameras "CAM_A_L" and "CAM_A_R"). The default group is named "DEFAULT". Group names (like camera Names) can be used to uniquely address commands to a specific group of networked cameras. Note: the group name is limited to 8 characters, default name is DEFAULT.

TARGET

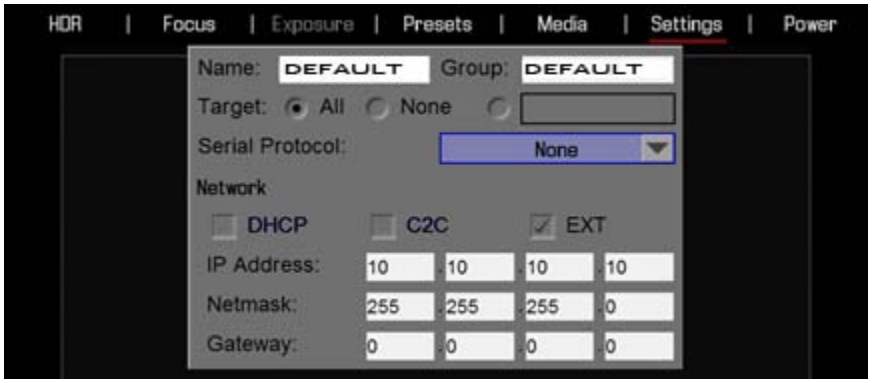
Using TARGET the user can specify if this camera can send commands to ALL devices on the network, to NONE of the devices on the network (meaning the camera will only listen to messages and not originate messages) or to a specific TARGET device - which can either be the NAME of a specific camera or device or a name of a GROUP of cameras or devices.

This structure allows for a lot of flexibility. For example on a multi-rig 3D shoot the user can either send commands to an individual camera (e.g. Set CAM_A_L to 1/48th exposure), to a group of cameras (e.g. Set "3DRIG_A" to 48 FPS), or to all cameras (e.g. Start Recording on all cameras). It is important to note that with the exception of the NONE setting, all command filtering is happening on the receiver side of the communication link.

SERIAL PROTOCOL

The camera can communicate to external devices via RS232 Serial Port and / or the Gigabit Ethernet Port.

This selection allows the user to specify the serial communications PROTOCOL. Available options are NONE, ELEMENT TECHNICA, 3ALITY SPC 7100 and 3ALITY SPC 7000. Default is NONE.


HDR | Focus | Exposure | Presets | Media | Settings | Power
Name: DEFAULT
Group: DEFAULT
Target: All None
Serial Protocol: None
Network
DHCP C2C EXT
IP Address: 10 10 10 10
Netmask: 255 255 255 0
Gateway: 0 0 0 0

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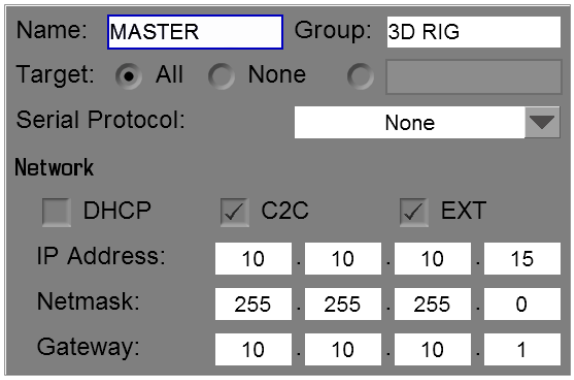
NETWORK

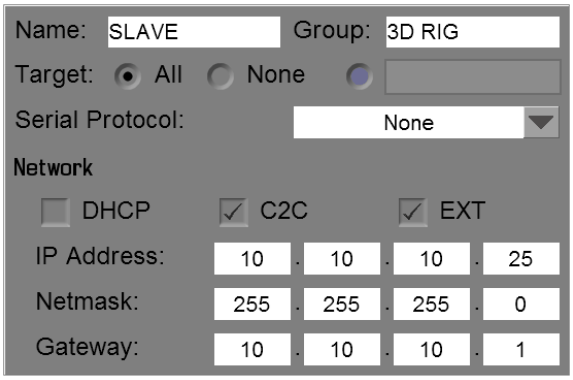
If the Gigabit Ethernet port is used, additional settings are required. Each camera or device requires a unique IP ADDRESS. For simple camera-to-camera communication via Ethernet, both cameras need to be in the same sub-net.

Use the same sub-NETMASK and GATEWAY addresses and the first three groups of the IP address need to be the same.

In the example below, two cameras two cameras are assigned to the group "3D RIG." Note the IP Addresses.


Name: MASTER
Group: 3D RIG
Target: All None
Serial Protocol: None
Network
DHCP C2C EXT
IP Address: 10 . 10 . 10 . 15
Netmask: 255 . 255 . 255 . 0
Gateway: 10 . 10 . 10 . 1

Master


Name: SLAVE
Group: 3D RIG
Target: All None
Serial Protocol: None
Network
DHCP C2C EXT
IP Address: 10 . 10 . 10 . 25
Netmask: 255 . 255 . 255 . 0
Gateway: 10 . 10 . 10 . 1

Slave

DHCP

If a DHCP-server is available in the communications network the DHCP option can be checked and the camera will obtain an IP Address, Subnet Mask and Gateway address automatically from the DHCP -server.

C2C

If the camera-to-camera (C2C) check box is checked, changes to the settings on this camera will be sent out via the network as UDP packets as a SET command (Which then sets the property on other cameras). SET commands sent to this camera will not be propagated.

EXT

If the EXT check box is checked this camera can be controlled via TCP/IP from an external device.

IP Address

Permits the user to adjust the camera's static IP address.

Netmask

Permits the user to adjust the Subnet Mask address.

Gateway

Permits the user to adjust the Gateway address.

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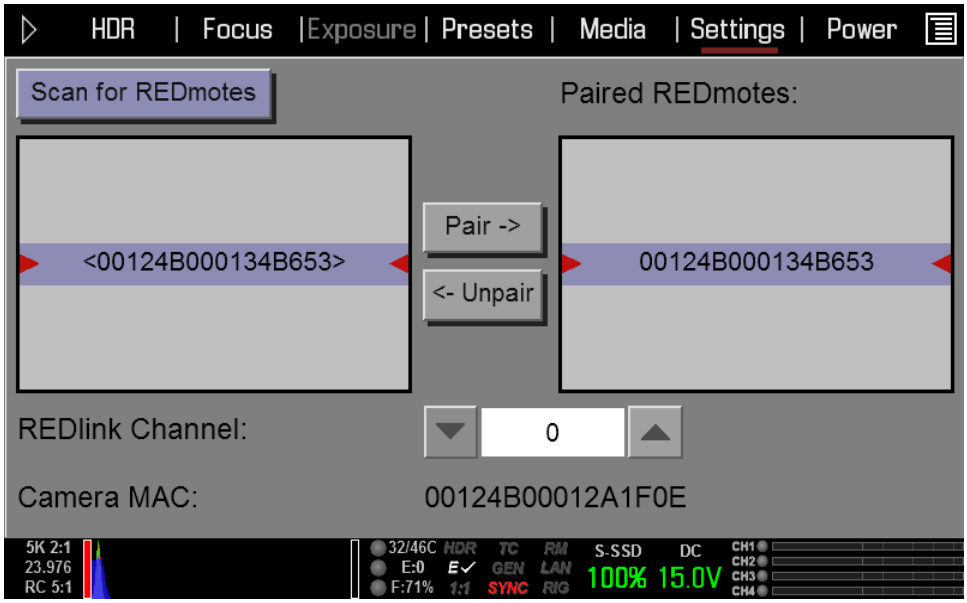
REDMOTE

This function is used to pair the camera to a REDMOTE for wireless operation.



SCAN AND PAIR REDMOTES

When selected, the camera will look for an attached REDMOTE, plus any REDMOTEs that are turned on with REDlink wireless enabled.

Available REDMOTES will appear in the left window.

The MAC Address for locally any attached REDMOTE will be in brackets <>.

Use the Pair and Unpair buttons to select and Pair/ Unpair REDMOTES.

MANUAL CHANNEL SELECT

The Manual Channel Select option allows the user to change the communication channel for the REDLink wireless connection in the event of interference from other wireless devices. Auto (unchecked) will pick the "cleanest" channel automatically on each camera boot. Manual Channel Select is the default setting and for default uses Channel 0.

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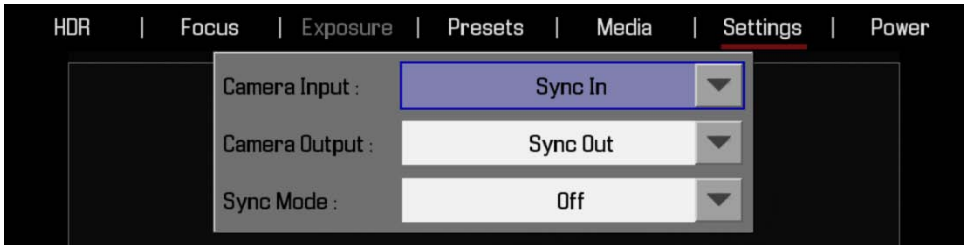
GPIO

GPIO selects the GPIO preferences sub-menu.



CAMERA INPUT

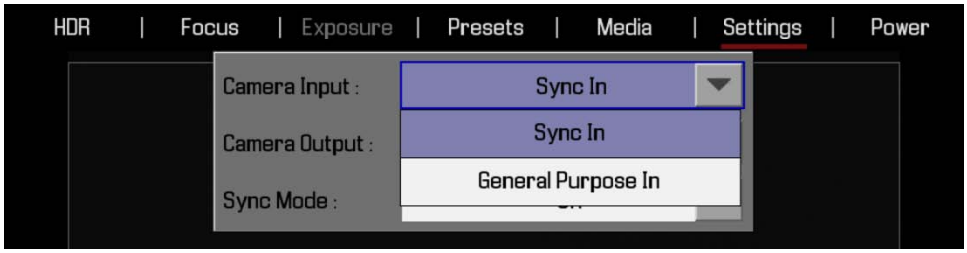
Permits the function of the SYNC IN / GPI pin in the SYNC connector to be defined as:

Sync In

Accepts an Input Sync signal to control Shutter Start timing.

General Purpose In

Accepts an Input Trigger signal to act as a General Purpose Input.


HDR | Focus | Exposure | Presets | Media | Settings | Power
Camera Input : Sync In
Camera Output :
Sync Mode :
Sync In
General Purpose In

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CAMERA OUTPUT

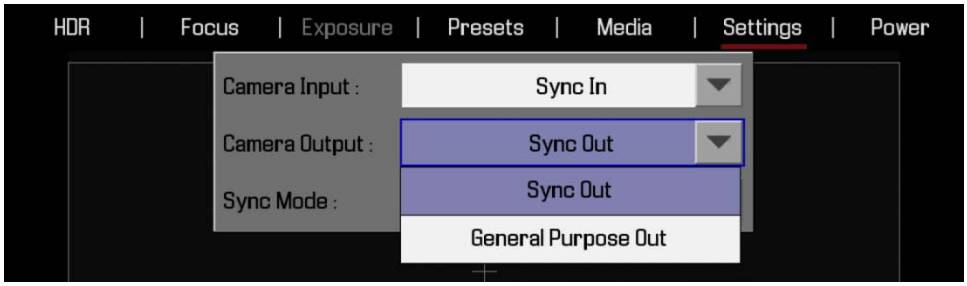
Permits the function of the SYNC OUT / GPO pin in the CNTL connector to be defined as:

Sync Out

Provides an Output Sync signal to act as a Shutter Start tally.

General Purpose Out

Provides an Output Tally to act as a General Purpose Output tally signal.



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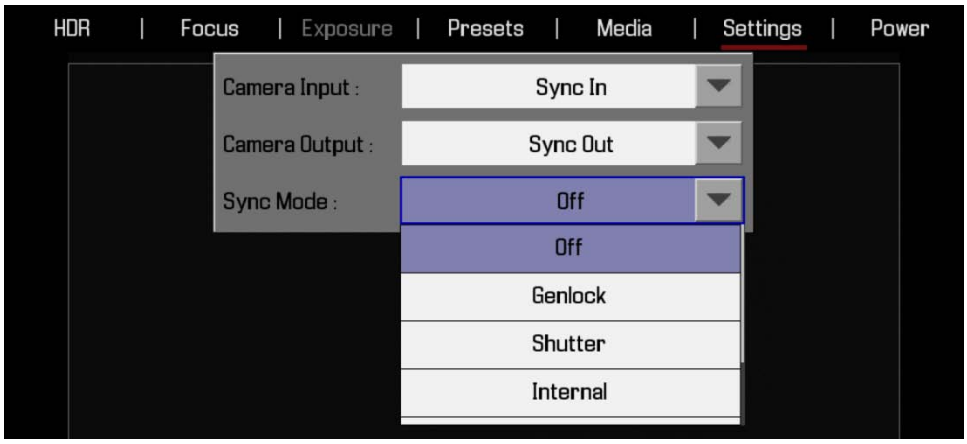
SYNC MODE

Allows the shutter timing (scan start) to be synced to an external signal.



Available options are OFF, GENLOCK, SHUTTER, INTERNAL, PROXY, and SLAVE. Default is Off.

OFF – Shutter start time is defined by internal camera timing.

GENLOCK – Shutter start time is slaved to an external RS170A tri-level sync signal .a.k.a. “Genlock”.

SHUTTER – Shutter start time is slaved to an external Shutter Sync signal.

INTERNAL – Not implemented at this time.

PROXY – Not implemented at this time.

SLAVE – Not implemented at this time.

IMPORTANT: If Sync > Genlock mode is selected, DO NOT set fps to higher than 72fps, and to a speed NOT a multiple of the project base rate and genlock input.

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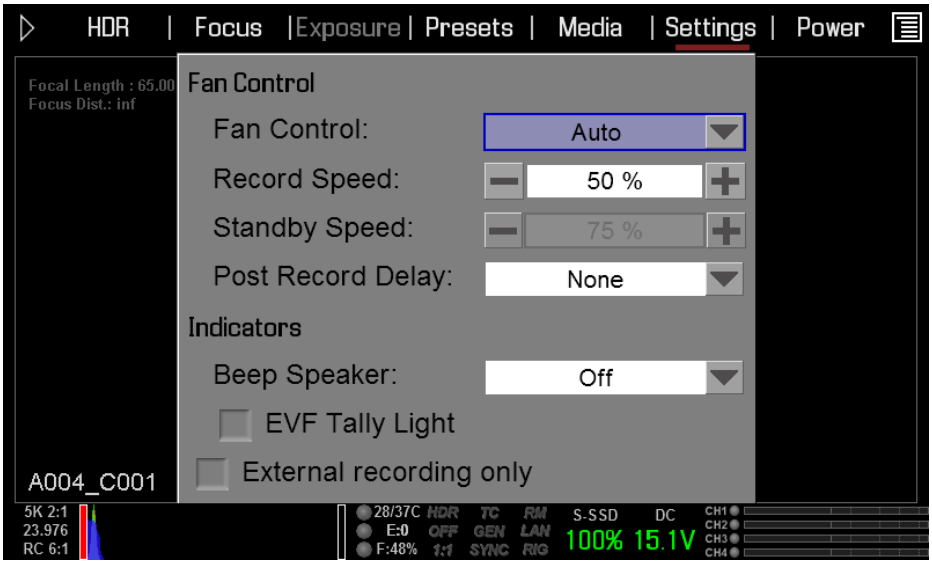
SYSTEM

Available options are FAN CONTROL, RECORD SPEED and STANDBY SPEED as well as BEEP SPEAKER and EVF TALLY LIGHT.



FAN CONTROL

Specifies cooling fan operation. Available options are AUTO and MANUAL. Manual will run the fan at the speeds specified in RECORD SPEED and STANDBY SPEED. Default setting is AUTO.

Auto

This setting selects VARIABLE speed fan operation in standby based on the camera core temperature.

Manual

This setting allows you to set a fixed fan speed to be used during Record and Standby modes.

Record Speed

Sets a fixed fan speed to be used during Record. Range 25 – 100%. Default is 50%.

Standby Speed

Sets a fixed fan speed to be used during Standby. Range 25 – 100%. Default is 75%.

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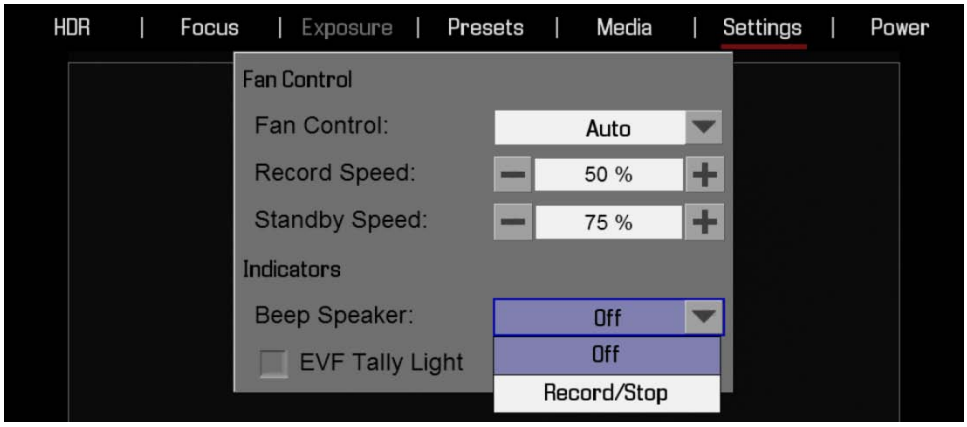
INDICATORS

Beep Speaker

Available options are OFF and RECORD/STOP. When RECORD/STOP is selected, an audible beep will be heard when record is started and another when record is stopped.

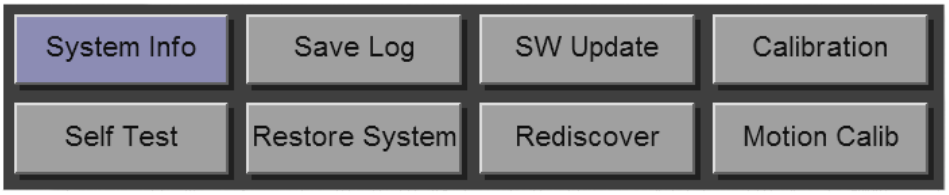


EVF Tally Light

When checked, enables the Record Tally Red LED on the front of the EVF.

MAINTENANCE

The maintenance menu allows the user to check system status and information, save the camera diagnostic LOG to attached media, perform a software update, calibrate the sensor, perform a camera self test, and reset system settings to factory defaults.



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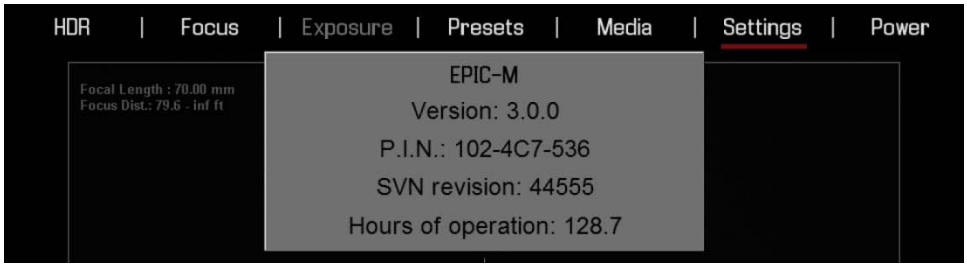
SYSTEM INFO

When selected the Viewfinder output(s) will display the camera Model, current firmware Version, installed and camera P.I.N.


HDR | Focus | Exposure | Presets | Media | Settings | Power
Focal Length : 70.00 mm
Focus Dist.: 79.6 - inf ft
EPIC-M
Version: 3.0.0
P.I.N.: 102-4C7-536
SVN revision: 44555
Hours of operation: 128.7

SAVE LOG

Select to write camera's .LOG file to the REDMAG 1.8" SSD. The .LOG file is a diagnostic tool that can assist RED with camera troubleshooting. After capture, upload the .LOG file to the RED customer service team contactable at **www.RED.com/support**.

After successfully writing the log file to media, viewfinder output(s) will display LOG SAVE COMPLETED. REDMOTE will also display this message.

If media is not attached to the camera when attempting to perform a write log request, external monitors will display NO MEDIA ATTACHED.

NOTE: Log files will be stored as *.txt files in the 1.8" SSD root directory.

SW UPDATE

NOTE: Firmware upgrade currently uses a force upgrade procedure as outlined in APPENDIX A: UPGRADING CAMERA FIRMWARE.

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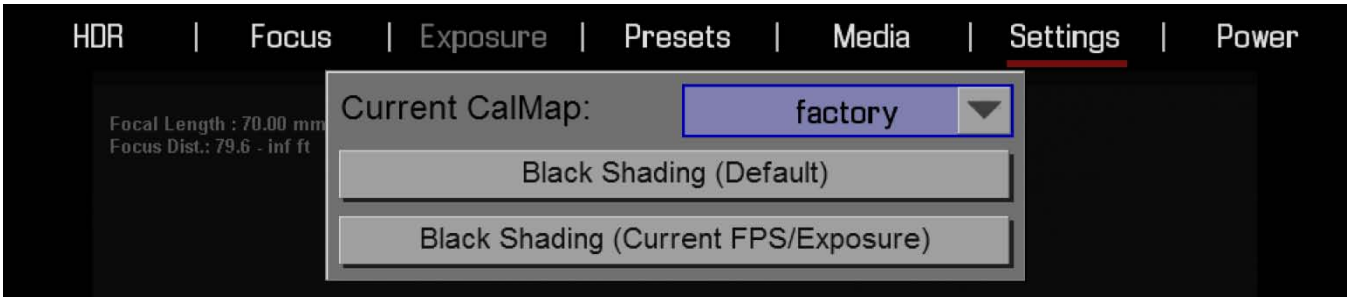
CALIBRATION

Sensor calibration is a process where the camera generates a calibration map to correct for pixel defects and offsets based on current system and environmental settings. This allows you to perform a Black Shading calibration of the MYSTERIUM X sensor two (2) different ways; Default (at 24 FPS @ 1/48 SEC) or using your current FPS/Exposure settings.


HDR | Focus | Exposure | Presets | Media | Settings | Power
Focal Length : 70.00 mm
Focus Dist.: 79.6 - inf ft
Current CalMap:
factory
Black Shading (Default)
Black Shading (Current FPS/Exposure)

To calibrate the sensor the image needs to be as dark as possible:

- At a minimum put a lens cap on the lens (WARNING: Not all lens-caps completely block IR. They are made to protect the lens, not necessarily to block light...)
- Preferably, take of the lens, and use the lens-mount cap provided by RED.
- If possible, use a dark room.
- Just closing the Iris is NOT sufficient.

Additionally a SSD needs to be inserted in the camera to store the raw images during calibration.

Calibration is required:

- If the temperature deviates significantly from the currently used calibration, it is recommended to recalibrate the sensor.
- If very long exposure (~longer then 1/24 Sec) is used it is recommended to recalibrate.

After Calibration with a lens cap on and ISO set to maximum, the sensor should show a uniform noise profile over the whole area without any falloffs on any side. You can check at which temperature/exposure time the currently used calibration was taken on under SETTINGS > MAINTENANCE > SYSTEM STATUS under Calibration.

Calibration maps will still be available after performing a system restore under SETTINGS > MAINTENANCE > RESTORE SYSTEM; however the factory calibration map will be reselected.

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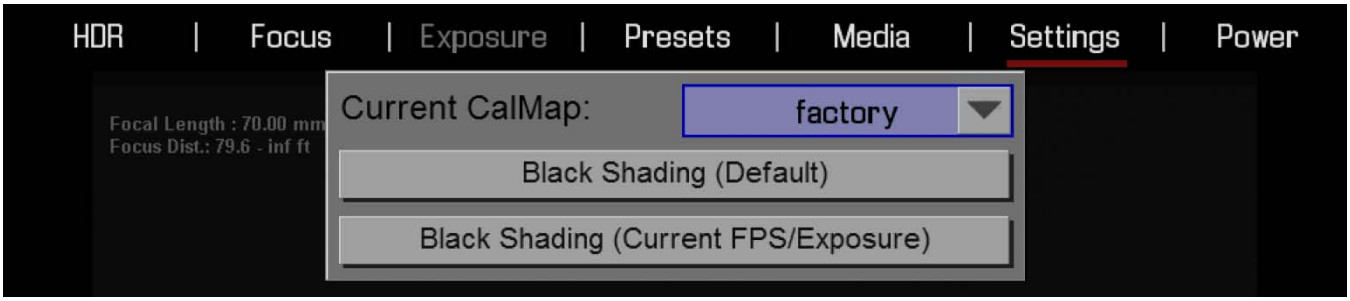
CURRENT CALMAP

Calibration maps are stored in the camera. Due to the nature of the camera, different calibration maps are needed for different situations.


HDR | Focus | Exposure | Presets | Media | Settings | Power
Focal Length : 70.00 mm
Focus Dist.: 79.6 - inf ft
Current CalMap:
factory
Black Shading (Default)
Black Shading (Current FPS/Exposure)

Factory

This is the calibration map generated during production. This map is always present and selected as default on first use after performing a system restore under SETTINGS > MAINTENANCE > RESTORE SYSTEM.

User HS

The user can select the CURRENT CALMAP. The dialog only shows the calibration maps stored in memory (FACTORY and USER HS in this case).

BLACK SHADING (DEFAULT)

This option uses fixed settings which are the same used for the factory calibration (around 23 Deg C).

BLACK SHADING (CURRENT FPS/EXPOSURE SETTINGS)

This option generates a calibration with the currently set frame rate/exposure. This can be used to generate a calibration for long exposures. After calibration (Which takes about 10 min), the new map is automatically selected.

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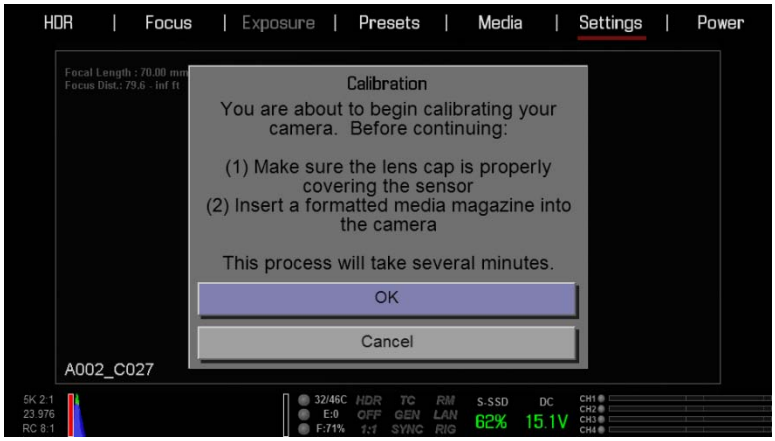
BLACK SHADING PROCEDURE

The calibration procedures are the same for both BLACK SHADING options.

The calibration procedures are the same for both Black Shading (24 FPS @ 1/48 SEC) and Black Shading (Current FPS/Exposure) options.

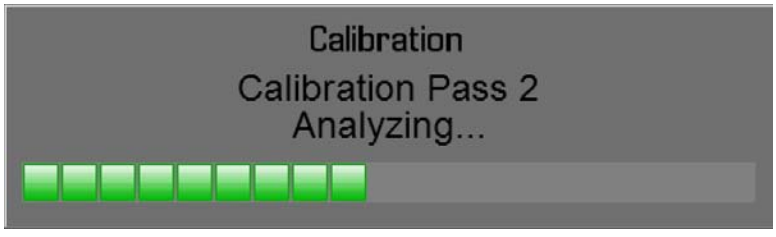
When selected, a screen will appear asking if you wish to proceed with Black Shading calibration. REDMOTE will also display the following messages.



Black Shading calibration procedure:

1. Ensure the sensor is NOT exposed to the calibration light source by installing the lens cap properly.
2. Ensure a properly formatted SSD is attached to the camera and properly formatted.
3. Select OK to perform the Black Shading calibration. The calibration will make 2 passes.
4. A status screen will show progress of the Capturing step. Second pass shown.

5. Once Capturing is complete, a status screen will show progress of the Analyzing step.



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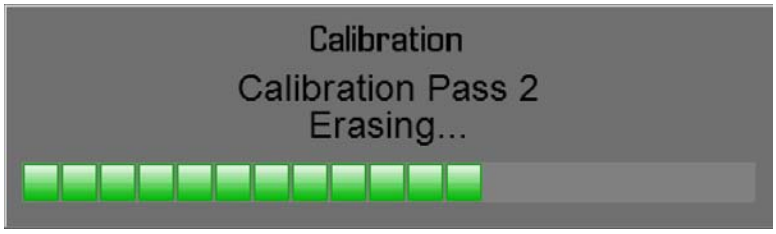
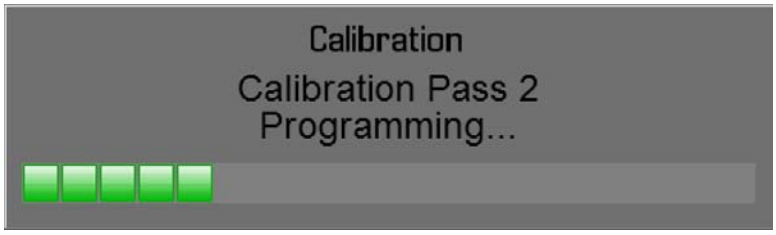
6. Once Analyzing is complete, a status screen will show progress of the Erasing step.

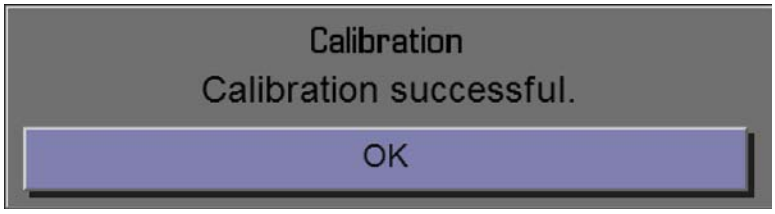


7. Once Erasing is complete, a status screen will show progress of the Programming step.



8. The camera will perform this procedure twice.

9. After Programming, CALIBRATION SUCCESSFUL will be displayed. Select OK to complete Black Shading calibration.



SELF TEST

When selected allows you to perform a self-test for the sensor and LCD Touchscreen.

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ENABLE / DISABLE SENSOR TEST PATTERN

When selected enables / disables the sensor test pattern (White Screen). To turn on, select ENABLE SENSOR TEST PATTERN.

To turn off, select DISABLE SENSOR TEST PATTERN.

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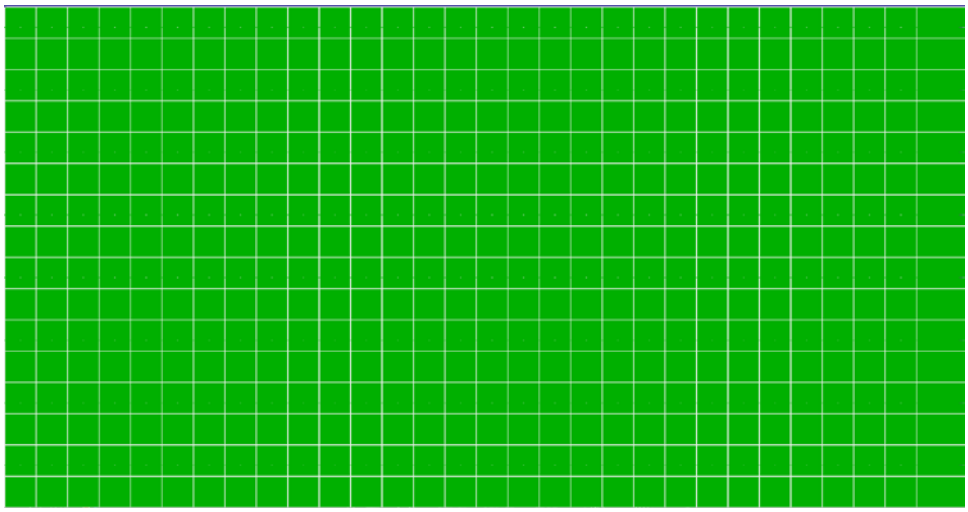
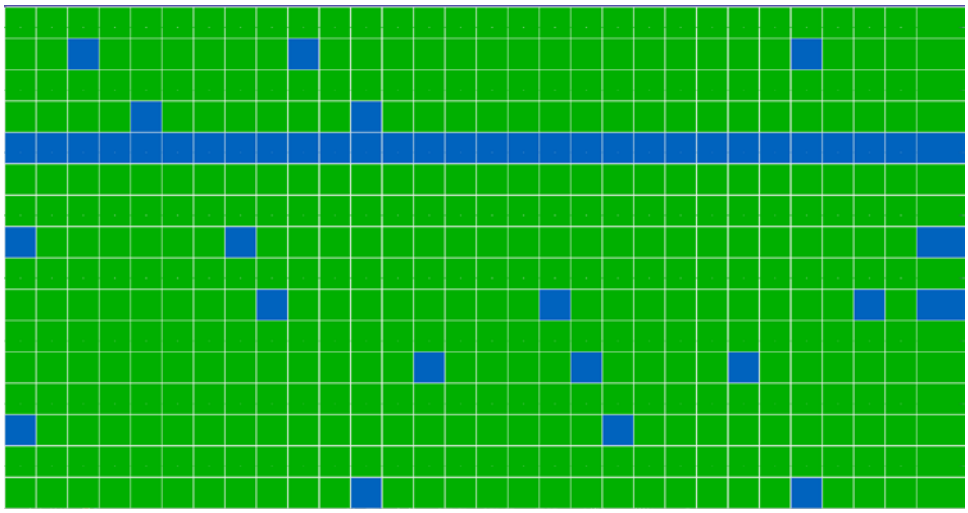
TOUCHSCREEN

When selected allows you to perform a touchscreen self-test.



When the touchscreen self-test is on, you can verify all areas of the touch screen respond to touch. Simply touch each box using your finger. The touchscreen responds to the touch and the Green box turns Blue.



To exit the Touchscreen Self-Test:

- Place your finger on the touchscreen and hold it there until the main screen appears.
- Press the Enter or Menu button on the Side Handle or REDMOTE.

RESTORE SYSTEM

Restore System permits ALL camera configuration and setup data to be reset to factory default values.

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When selected, you will be asked to confirm if you want to delete all settings and restore the factory default settings. After settings are restored, "DEFAULT SETTINGS RESTORED, INITIALIZING RESTART…" Camera will automatically power down and will require you to manually power it up.

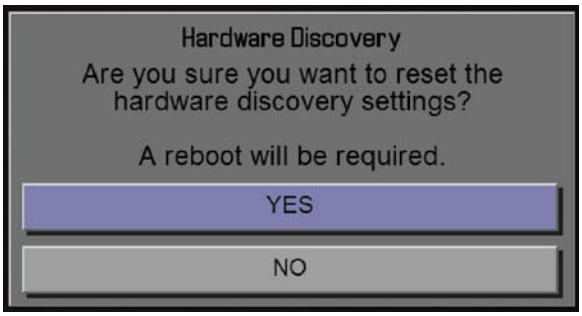
Reset Factory Defaults
Are you sure you want to delete all user settings and restore the factory defaults?
A reboot will be required.
YES
NO

NOTE: User key settings will be reset as well as any other changes from the cameras default settings. The REDMOTE will also require paring to communicate wirelessly with the camera.

REDISCOVER

Rediscovers all hardware and caches the data for future boot cycles.

When selected, you will be asked to confirm if you want to reset all hardware discovery settings. After settings are reset, "RESET HARDWARE DISCOVERY SUCCESSFUL, INITIALIZING RESTART…" Camera will automatically power down and will require you to manually power it up.



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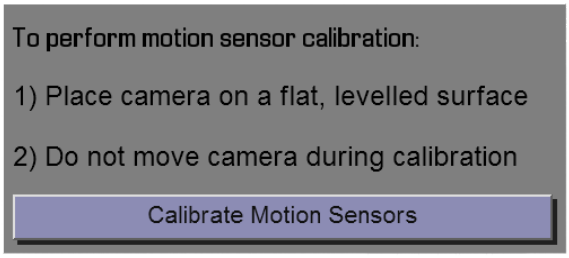
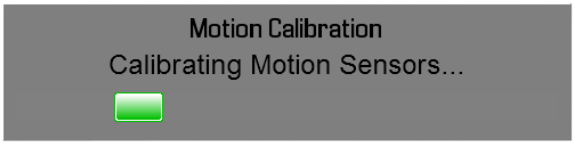
MOTION SENSOR CALIBRATION

The RED DSMC Camera displays data from the accelerometer to help orient the camera. After a firmware upgrade or Factory Restore the motion sensors need to be re-calibrated through the Maintenance->Motion Calib menu."


To perform motion sensor calibration:
1) Place camera on a flat, levelled surface
2) Do not move camera during calibration
Calibrate Motion Sensors



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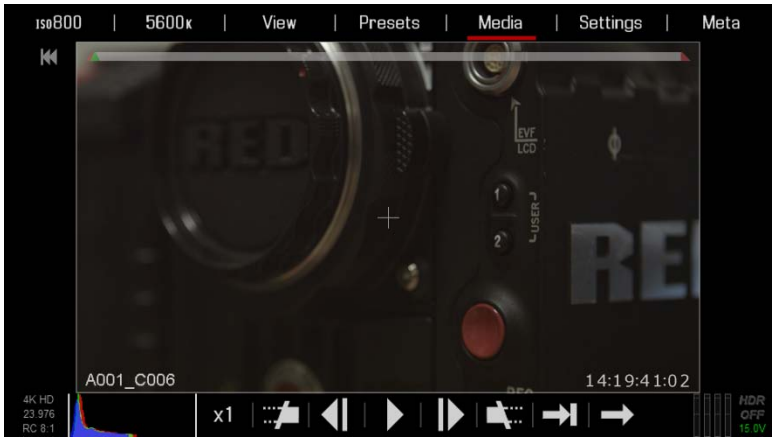
PLAYBACK

Playback allows you to view clips on media currently attached to the camera. It also allows you to change the look of the playback clips be changing settings available when in playback mode.

NOTE: SCARLET-X™ menus shown, EPIC menus similar.



UPPER CONTROLS

From Left to Right are ISO, WHITE BALANCE, VIEW, PRESETS, MEDIA, SEETINGS, and META. Below the settings is the clip playback status bar.

Exit Playback ICON (Touchscreen)

Select the O on the Left to exit Playback mode.

NOTE: The Menu ICON on the Right does not respond to commands when in Playback mode.

ISO

Allows you to change the ISO in the clip during playback.

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WHITE BALANCE

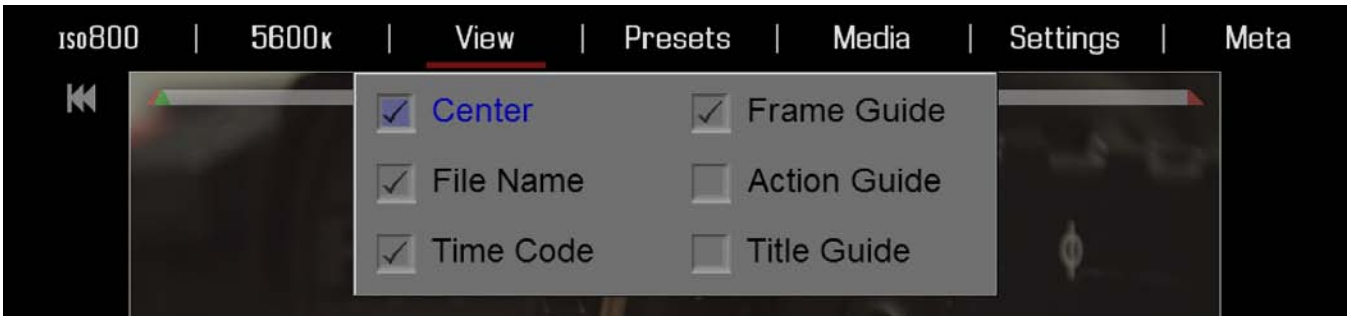
Allows you to change the White Balance in the clip during playback.

Advanced Menu

Opens the advanced White Balance settings without the ability to Calculate.

VIEW

Allows you to select the items to be displayed in the playback window. Available options are Center, File Name, Time Code, Frame Guide, Action Guide, and Title Guide.



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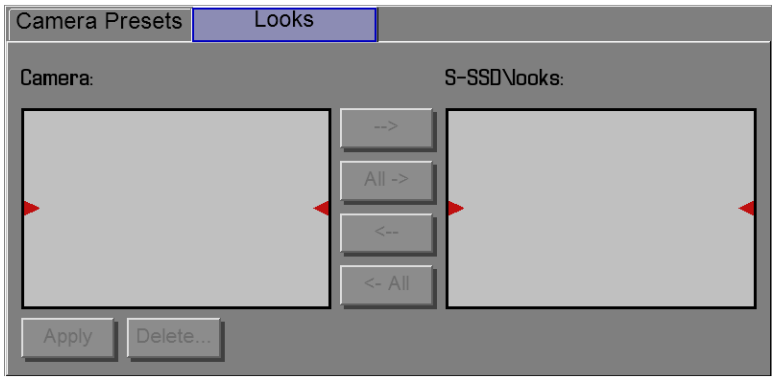
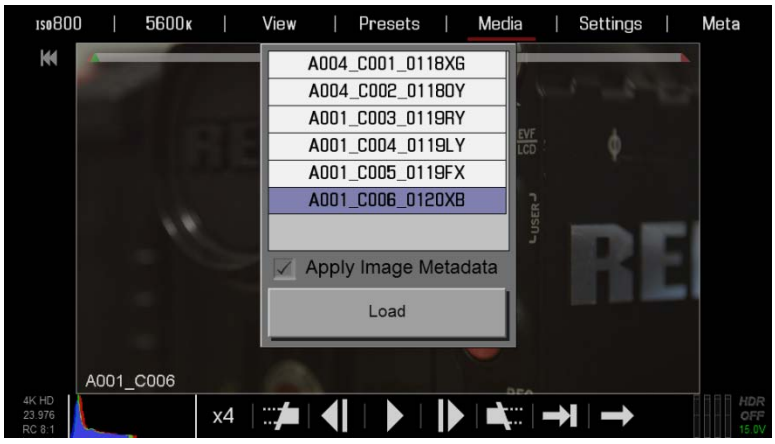
PRESETS

Allows you to apply presets to the clip during playback.



MEDIA

When selected will list all available clips on the attached media.



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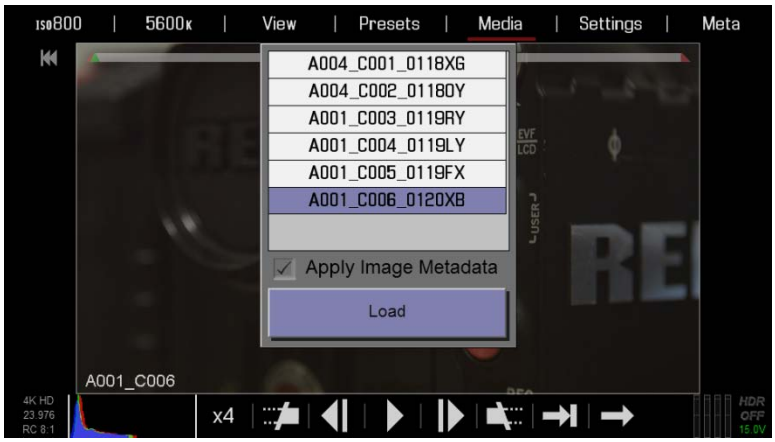
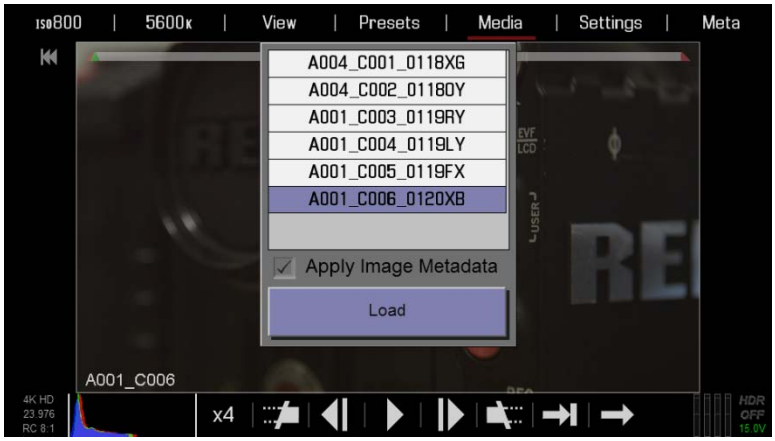
Touchscreen

1. Double-Tap the desired clip to open in the playback window.
2. Load will also highlight. You can also select LOAD to load the clip in the player and allow playback.



Side Handle / REDMOTE

1. Select the desired clip to playback and press the ENTER button.
2. Load will highlight. Select LOAD to load the clip in the player and allow playback.



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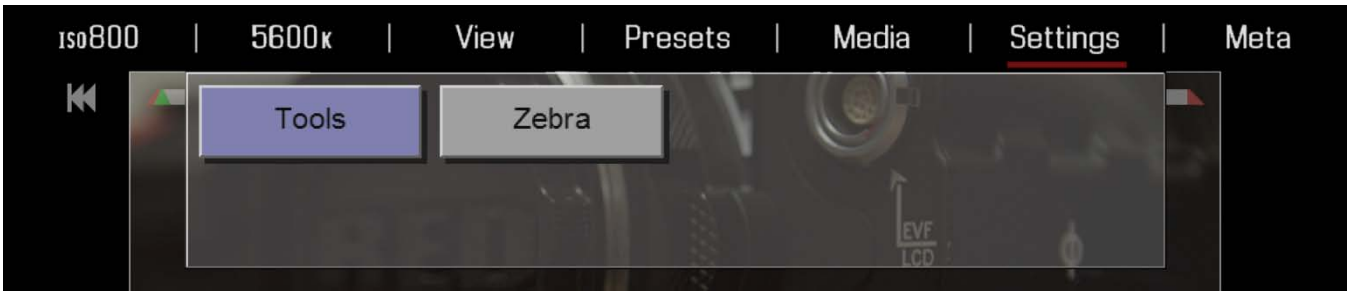
SETTINGS

Available options are DISPLAY, LOOK and RECORD.

Display

Available options under Display are TOOLS and ZEBRA.

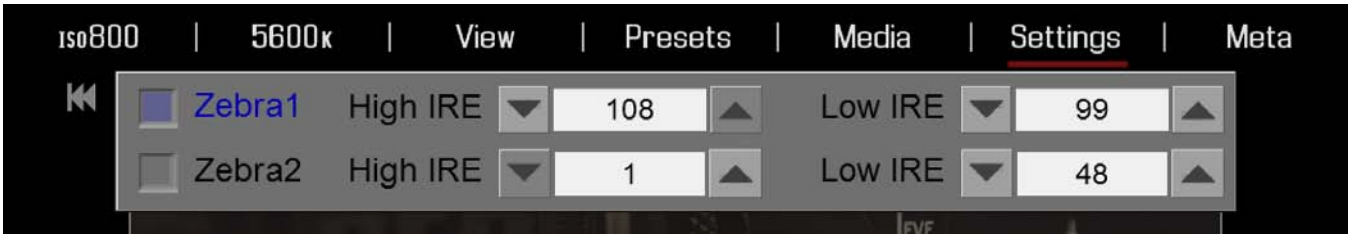


Tools

Allows you to toggle ON/OFF Exposure, Focus, Video, Edge, and RAW. Refer to SETTINGS MENU > DISPLAY > TOOLS for complete details about these options.

Zebra

Allows you to toggle ON/OFF Zebras. Refer to SETTINGS MENU > DISPLAY > ZEBRA for complete details about these options.



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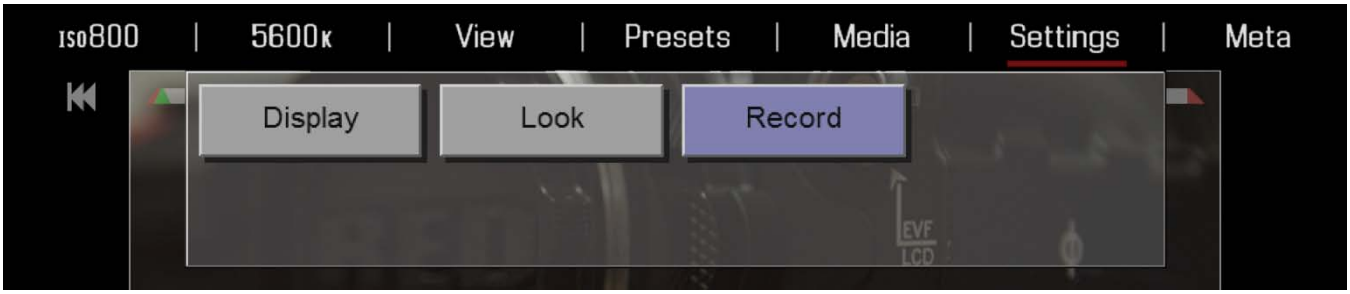
Look

Allows you to adjust the Color, Gain, FUT, and Curve of the image during playback. Refer to SETTTINGS MENU > DISPLAY > LOOK for complete details about these options.

Record (Exit)

When selected will exit playback to the main menu.



META

Displays current clip META information.

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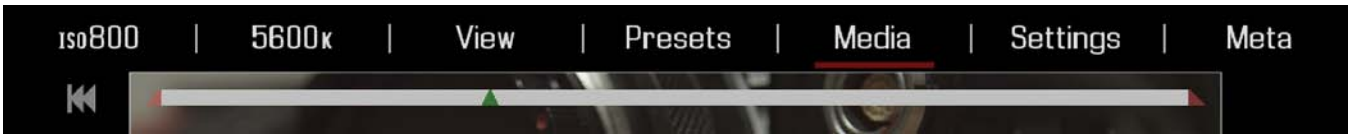
CLIP PLAYBACK STATUS BAR

Displays the progress of the clip during playback.

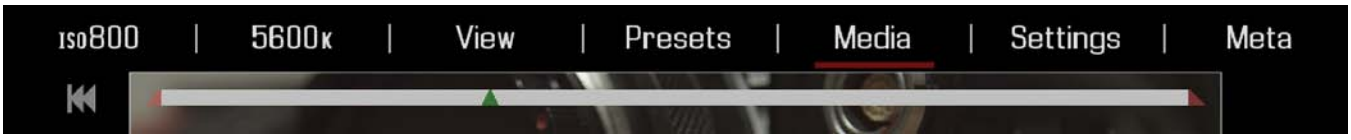


Touchscreen

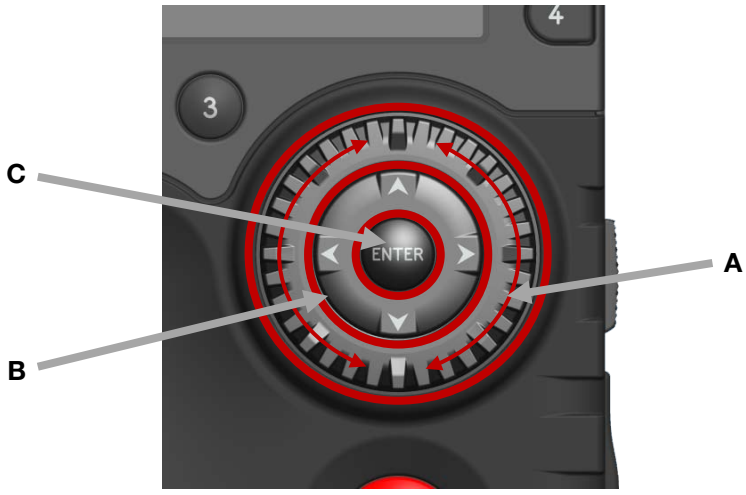
When using the touchscreen you can swipe your finger Left or Right to open and allow playback of the previous or next clip on the media.

Side Handle / REDMOTE

When using the Side Handle or REDMOTE you can use the navigation group to highlight the clip playback status bar.



The navigation group will also allow you to perform the following actions to the clip:



A	Scroll Wheel	**B**	Directional Pad	**C**	Enter Button

- **Scroll Wheel:** Rotating Clockwise or Counter-Clockwise will move through the clip on frame at a time forwards or backwards.
- **Directional Pad:** Pressing Left or Right to open and allow playback of the previous or next clip on the media.
- **ENTER Button:** Pressing the ENTER button controls Play / Pause of playback.

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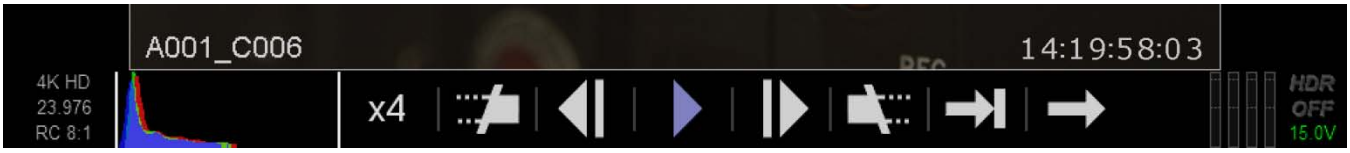
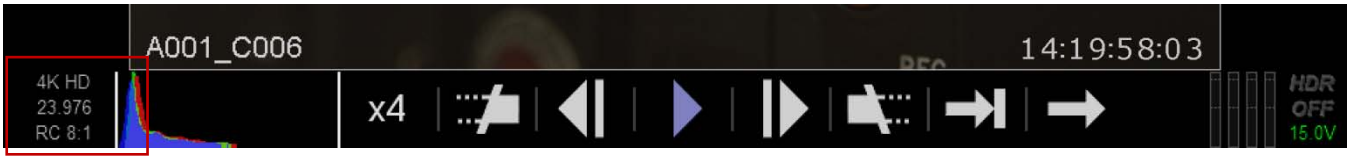
LOWER CONTROLS

From Left to Right, PLAYBACK SPEED, IN POINT MARKER, FRAME-BY-FRAME REVERSE, PLAY/PAUSE, FRAME-BY-FRAME FORWARD, OUT POINT MARKER, PLAY ONCE/LOOP, and PLAYBACK DIRECTION



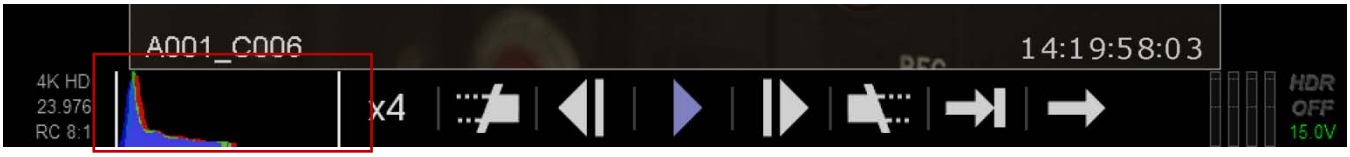
RESOLUTION / PROJECT FRAMERATE / QUALITY

Display clip Resolution, Framerate and Quality (REDCODE). When using the touchscreen, touch the Resolution, Framerate and Quality (REDCODE) to display the METADATA for the clip.



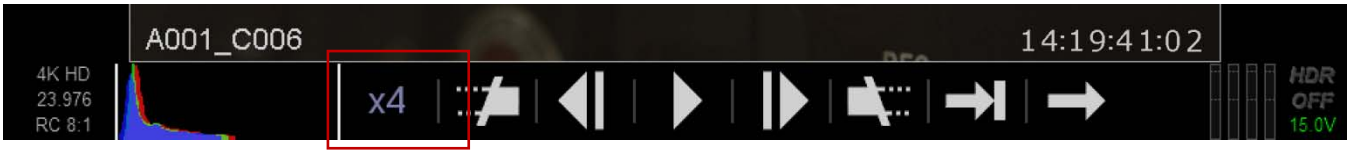
HISTOGRAM

Displays the clip histogram. The histogram will change based on any changes made in the Upper Controls. When using the touchscreen, touch the histogram to display the TOOLS menu.



PLAYBACK SPEED

Allows you to select x1, x2, x4, x8, or x16 playback speed.



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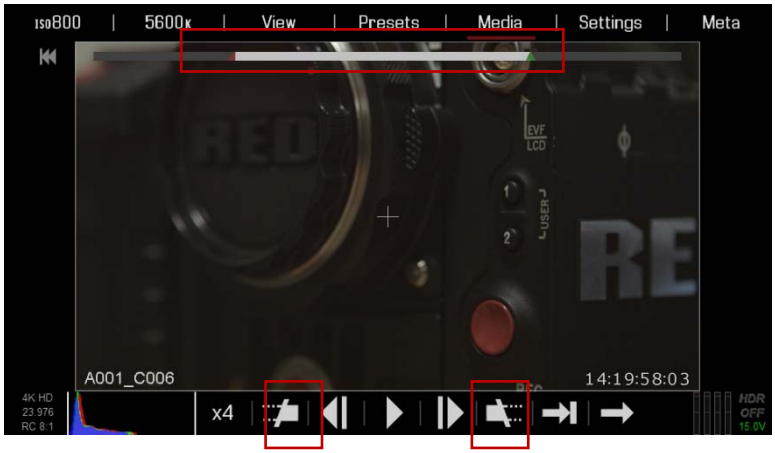
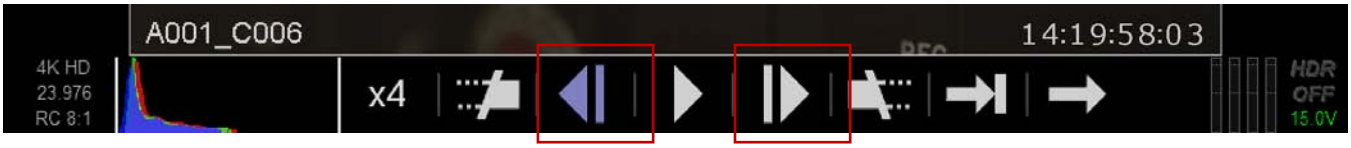
IN / OUT POINT MARKER

Allows you to set In and Out Points during clip playback. This allows you to playback only a certain portion of the clip as desired. Helps when the clip is rather long and you want to focus on a particular segment. The In (Red) and Out (Green) points will be displayed in the Clip Playback Status Bar. You can use the navigation group to select the exact location of the In and Out Points if desired.



FRAME-BY-FRAME REVERSE / FORWARD

Allows you to move through the clip frame-by-frame in the reverse direction.

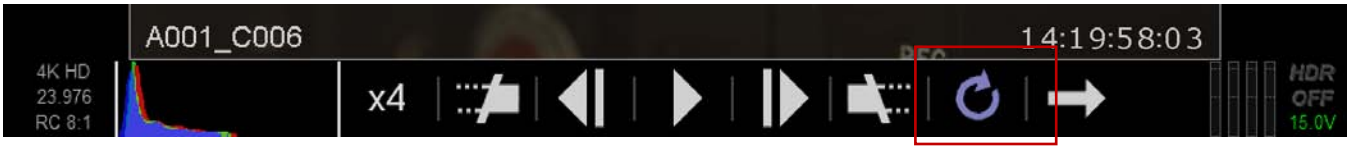


PLAY / PAUSE

Allows you to play and pause the clip.

PLAY ONCE / LOOP

Allows you to choose to play the clip one time or to loop the clip in the player. Loop is shown below.



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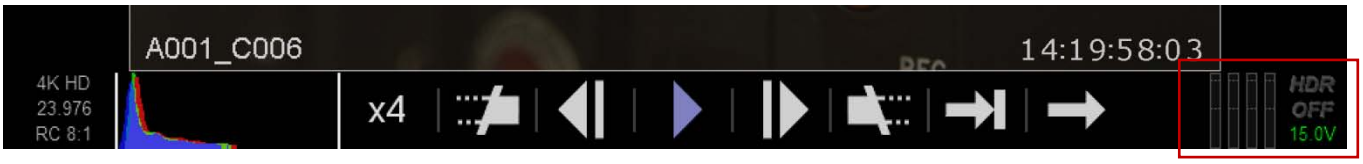
PLAYBACK DIRECTION

Allows you to play the clip forward or backwards. Reverse playback is shown.

ADDITIONAL CLIP/CAMERA INFORMATION

Will indicate if clip was recorded in HDRx and current camera power status as well as audio input signals.



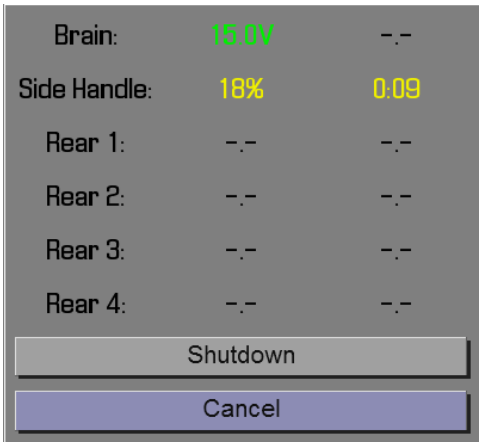
POWER

The power menu displays the current power status of all attached power sources as well as allows you to shutdown the camera.

POWER STATUS

The power status is displayed for the BRAIN, SIDE HANDLE, REAR 1, REAR 2, REAR 3, and REAR 4.

Below is what is displayed when the camera is connected to DC power and a REDVOLT is installed into the side handle with REDVOLT batteries installed in the optional QUAD BATTERY MODULE.



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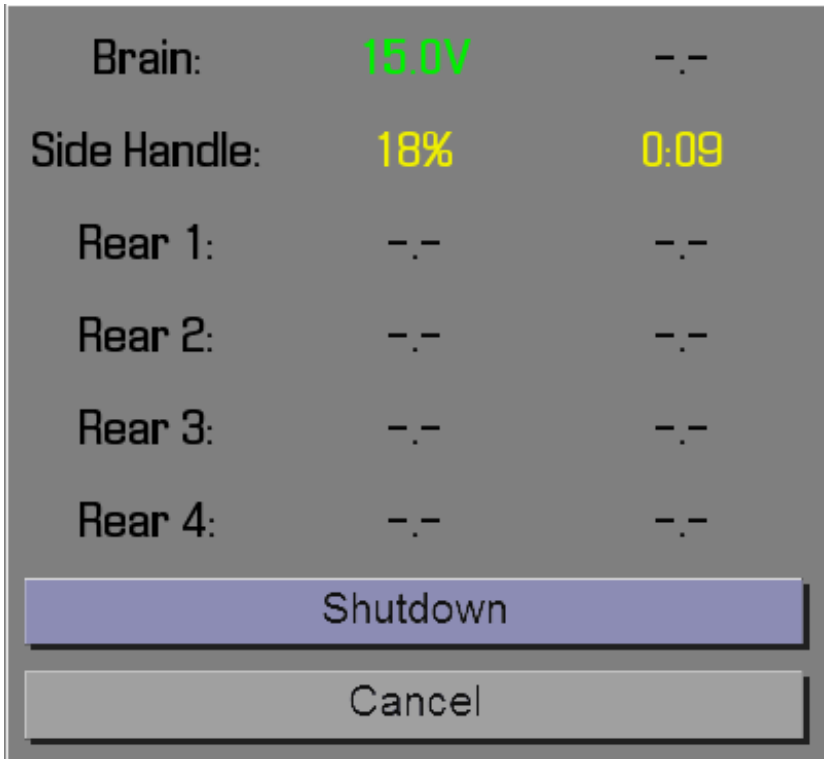
SHUTDOWN

Power OFF controls are interlocked to prevent accidental powering down of the camera. For details on the different ways to power down your RED DSMC Camera, refer to BASIC OPERATION > POWER DOWN.

1. Enter the Secondary Menu using the touch screen, REDMOTE or Side Handle.
2. Select POWER.
3. Select SHUTDOWN.



4. The camera will immediately power down displaying SHUTTING DOWN…. If a REDMOTE is connected, the same message will display.

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APPENDIX A: UPGRADING CAMERA FIRMWARE

Your RED DSMC camera functionality may be upgraded by installing the latest firmware.

Camera firmware is identified by Version and SVN number, which will be displayed by the camera on the LCD display when SYSTEM INFO is selected. A higher number reflects a later release.

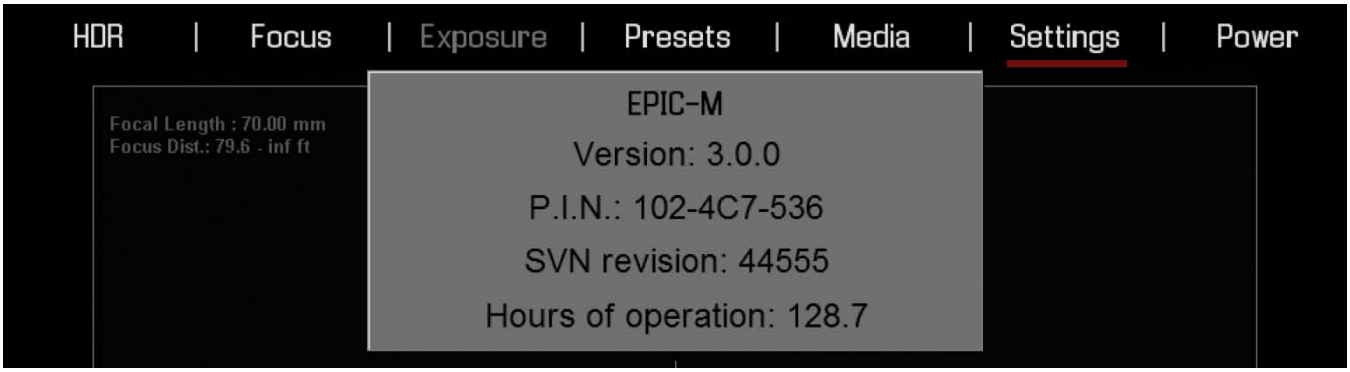
Make a habit of frequently visiting **www.RED.com/support** to check for later versions of camera firmware, Operations Guide updates, and post-production software.

Your REDMOTE also requires a firmware upgrade. Go to APPENDIX E: REDMOTE OPERATION > MAINTENANCE > UPGRADING REDMOTE FIRMWARE.

VERIFY CURRENT CAMERA FIRMWARE

With the camera ON, select SECONDARY MENUS > SETTINGS > MAINTENANCE > SYSTEM INFO.

The camera's P.I.N. number and current firmware version will be displayed.


HDR | Focus | Exposure | Presets | Media | Settings | Power
Focal Length : 70.00 mm
Focus Dist.: 79.6 - inf ft
EPIC-M
Version: 3.0.0
P.I.N.: 102-4C7-536
SVN revision: 44555
Hours of operation: 128.7

UPGRADE PROCEDURE

1. Download current firmware from **http://www.RED.com/support**.
2. Follow instructions in "Epic_read_me…" file.
3. To restore factory default settings, hold the power button down for 15 seconds while the camera is powering up.

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APPENDIX B: MANAGING DIGITAL MEDIA

MEDIA

REDMAG 1.8" SSD is available with capacities of 64GB, 128GB or 256GB. Record duration is dependent on resolution, quality and frame rate, but a 64GB SSD will typically provide 24 minutes of 24fps 5K RAW recording.

On MAC computers with REDCINE-X PRO installed, RED Watchdog will mount the SSD as "READ-ONLY" by default and you cannot write the firmware to the SSD. RED Watchdog is identified by the RED Coin icon located on the Right side of the Menu Bar. Right-click on the icon to enter RED Watchdog settings and change to mount the drive as "READ-WRITE" to allow you to save the firmware to the SSD. Refer to REDCINE-X PRO OPERATION GUIDE for complete RED Watchdog instructions and details.

IMPORTANT: After connecting REDMAG 1.8" SSD to the camera and BEFORE recording, you should format the media using the camera (even if formatting was previously performed on a computer). Go to ADANCED MENU > MEDIA > FORMAT to properly format media before recording.

FORMATTING MEDIA

Media must be formatted prior to using it for recording. Formatting is performed on camera, although media may be erased on a Macintosh OS X personal computer, allowing the camera to just add the necessary project profile and clip log data.

NOTE: Media formatted on-camera will use a name and root volume in the format:

Camera Letter + Reel Number + Month + Day + ** where ** is a two digit alphanumeric random number generated by the camera for each file e.g. A001_0512A6.RDM

Clips recorded to the media follow similar naming conventions

A001_C001_0512A6_001.RDC **and** A001_C001_0512A6_H.mov etc.

IMPORTANT: Media must always be un-mounted prior to removal or disconnection from the camera. This ensures power is removed from the digital media and any open data files are closed. Failure to do so may result in lost data or corrupted files. Refer to REMOVE MEDIA FROM CAMERA (UNMOUNT).

This procedure outlines the formatting of REDMAG 1.8" SSD media using the RED DSMC camera. Formatting the SSD media will take about 10 seconds.

1. Insert SSD into camera.
    - Insert the REDMAG 1.8" SSD with the RED logo facing outward (away from camera body). SSD firmly into its slot, but without using excessive force to prevent damage.
2. When SSD media is inserted into the camera, the camera will recognize if the media is unformatted:
    - On LCD, EVF and external monitors, in the media section of the GUI, NONE will be displayed twice (as opposed to when no media is inserted, the GUI displays NONE with three dashes below "---").

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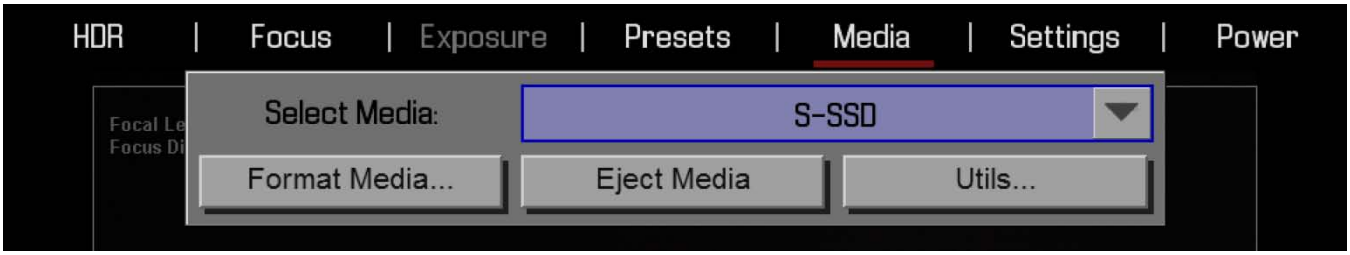
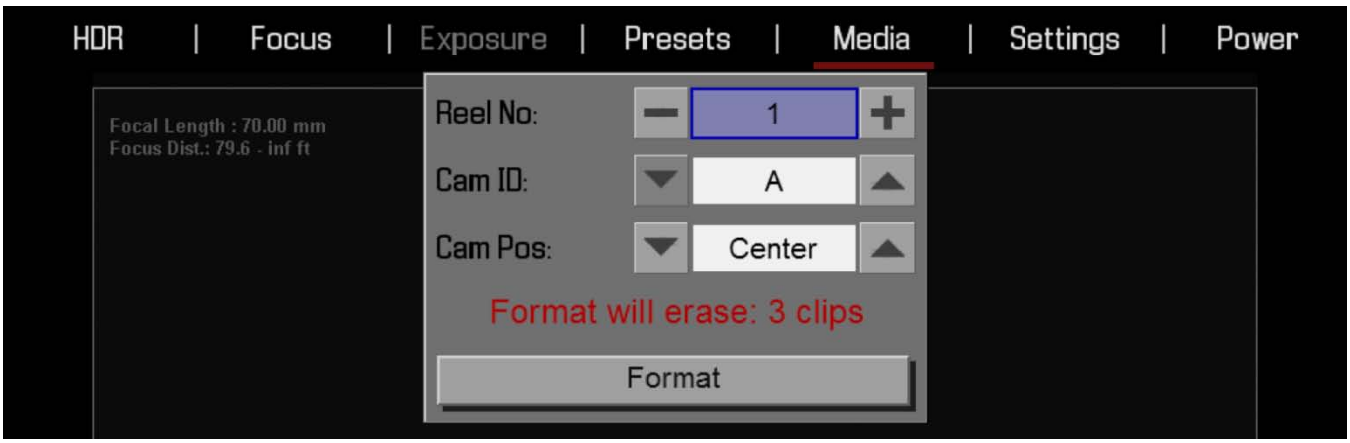
- On REDMOTE, NONE will be displayed twice (as opposed to when no media is inserted, the GUI displays NONE with three dashes below "---").
- On the Side Handle, NA will be displayed (same as if no media is present).

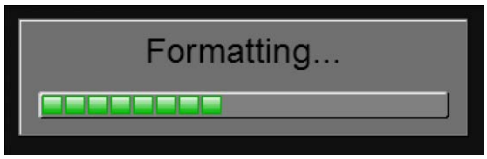
3. To format the media select SECONDARY MENUS > MEDIA > FORMAT MEDIA.



4. You will be prompted to set the media and select FORMAT.

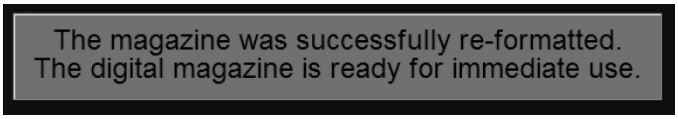


- Viewfinder output(s) will display "FORMATTING".



NOTE: If when selecting FORMAT, the display indicates FORMAT FAILED, refer to MEDIA ERRORS.

5. Once formatting is completed, the Viewfinder output(s) will display "THE MAGAZINE WAS SUCCESSFULLY FORMATTED THE DIGTAL MAGAZINE IS READY FOR IMMEDIATE USE".



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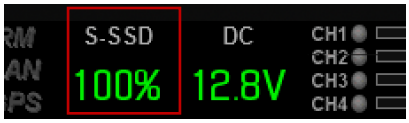
MEDIA CAPACITY REMAINING STATUS

The Viewfinder output(s) will display the remaining media capacity in the MEDIA indicator (100% is shown).



At 10%, remaining capacity the media status will turn yellow, at 5% it will turn red. At 2%, remaining the camera will cease recording. This reserves a small amount of capacity for ancillary data to be written to the media.

NOTE: When media is full, the Side SSD LED will flash Red.

EJECT MEDIA FROM CAMERA (UNMOUNT)

IMPORTANT: Media must always be Ejected (un-mounted) prior to removal or disconnection from the camera. This ensures power is removed from the digital media and any open data files are closed. Failure to do so may result in lost data or corrupted files.

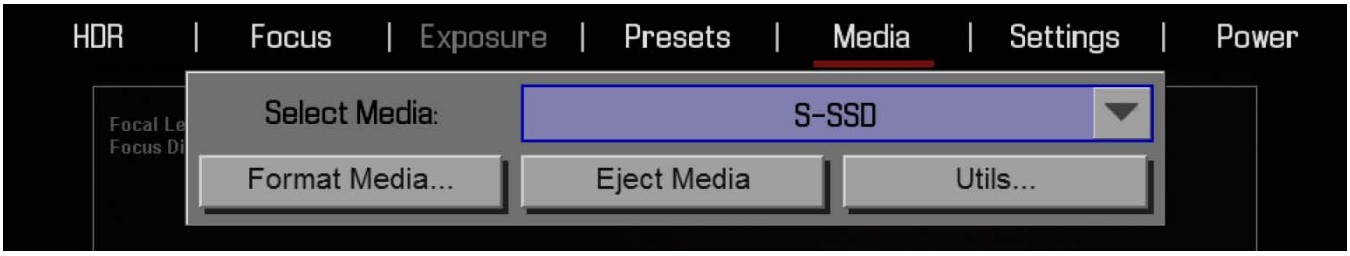
Removing an SSD without first un-mounting it will not physically damage the media, however it does increase the risk of file corruption, so it's good operational practice to un-mount the media if possible before removing or disconnecting.

IMPORTANT: Unmounting the digital media takes a few seconds, protects the integrity of your recorded data and helps clips mount instantly to your workstation once in post-production, so it's a recommended habit to develop. If you do not un-mount the media the camera will offer a warning – your files may not be damaged, but you will have been warned!

NOTE: The camera will respond to physical removal of the media without un-mounting and display "MEDIA REMOVED PRIOR TO UNMOUNT – DATA INTEGRITY RISK".

USING REDMOTE / TOUCHSCREEN LCD

1. Go to SECONDARY MENUS > MEDIA.



2. Select EJECT MEDIA.

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3. When media is ejected, Viewfinder output(s) will display “MEDIA EJECTED SUCCESSFULLY“.

4. Media can now be removed from the camera.

USING SIDE HANDLE

1. By default, the lower of the three (3) SYSTEM KEYS is set to Eject Media when pressed.

2. When media is ejected, Viewfinder output(s) will display “MEDIA EJECTED SUCCESSFULLY“.

3. Media can now be removed from the camera.

USING SIDE SSD

1. Press both User Keys 1 and 2 at the same time to eject REDMAG 1.8” SSD Media.
2. When media is ejected, Viewfinder output(s) will display “MEDIA EJECTED SUCCESSFULLY“.

3. Media can now be removed from the camera.

COPYING MEDIA

For use when media is connected directly to your computer. When copying media, it is recommended that you drag the complete .RDM folder on the digital magazine to the archive storage media. This copies all the media and metadata files. You will not need to copy the log, magazine profile, or presets files, but if you do so, it will do no harm.

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ERASING MEDIA

NOTE: If the media was formatted using SECURE FORMAT, you cannot erase the media using an external source. Erasing of the media must be performed by formatting on the camera.

MACINTOSH OS X

1. Connect the REDMAG 1.8” SSD via RED STATION REDMAG 1.8".
2. Open the Disk Utility.
3. Carefully choose the drive from the list on the left.
4. Select the Erase tab.
5. Choose MS-DOS (FAT) as the Volume Format. You can add a Name if desired, however the camera will overwrite this.

IMPORTANT: Before performing the next step, double-check that this is the correct SSD that you wish to erase DATA FROM.

6. Select Erase. When the pop up window appears click on the Erase button.
7. When the media is erased, drag its icon to the trashcan and physically disconnect it.
8. The media will need to be formatting by the camera before use. Refer to FORMATTING MEDIA.

WINDOWS

1. Connect the REDMAG 1.8” SSD via RED STATION REDMAG 1.8".
2. Open Windows Explorer (go to my computer icon, right click and select EXPLORE).
3. Double-click on the drive you wish to erase files from.
4. Select all the files on the drive you wish to erase.

IMPORTANT: Before performing the next step, double-check that this is the correct SSD that you wish to erase DATA FROM.

5. Press the “DELETE” key on the keyboard, select FILE > DELETE or right-click on selected file and choose DELETE. When the pop up window appears click YES.
6. The media will need to be formatting by the camera before use. Refer to FORMATTING MEDIA.

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APPENDIX C: INPUT / OUTPUT CONNECTORS

CAMERA BRAIN FRONT

A	MIC-1 3.5mm Audio Jack	**B**	MIC-2 3.5mm Audio Jack

Camera Brain Connectors - Front

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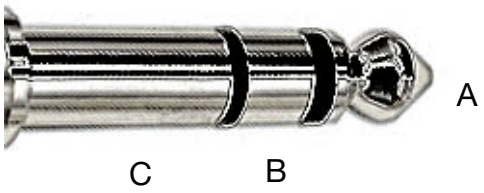
MIC-1, MIC-2 (MICROPHONE AUDIO)

Two 3.5mm phone jacks on the front of the brain support two independent channels of balanced or unbalanced microphone level analog audio inputs.



Microphone Input Connector

PIN	SIGNAL	DESCRIPTION	DIRECTION
A (TIP)	IN +	Mic Input (+48V Phantom Power)	In
B (RING)	IN -	Mic Input (+48V Phantom Power)	In
C (SLEEVE)	GND	Camera ground	--

Microphone Level analog audio input signals are routed via a high quality pre-amplifier and soft limiter, whose Gain may be controlled using the Input Level control to achieve the desired audio reference / recording level. Microphone inputs support +48V @ 10mA Phantom Power as a user selectable option. If

To assist with reference level setup, the camera provides a color-coded Peak Level Meter in the Graphical User Interface, with witness marks that indicate 0dBu (-20dbFS) and 0Vu (- 16dBFS) levels.

Peak Level Meter range is –36dBu to +20dBu (-54dBFS to 0dBFS) and provides input clip indication.

NOTE: A pre-fabricated XLR to TRS interface cable, Part Number 790-0229, is available from RED Digital Cinema**.**

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CAMERA BRAIN REAR

A	HD-SDI
B	Headphone
C	SYNC (Video Sync)
D	CTRL (RS232 Control)
E	GIG-E (Ethernet)
F	DC IN (Power Input)
G	HDMI

Camera Brain Connectors - Rear

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HD-SDI

A standard 75 Ohm BNC connector provides a broadcast specification high definition video output.

PIN	SIGNAL	DESCRIPTION	DIRECTION
Center	HD-SDI	SMPTE-292M HD-SDI	Out
Shield/Screen	GROUND	Camera ground	--

HD-SDI Output

The HD-SDI output provides a 720p progressive scan video feed operating at 50.00 or 59.94 Hz or a 1080p 10-bit 4:2:2 progressive scan video feed operating at 23.98, 24.00, 25.00 or 29.97 Hz when in 1.5GHz HD-SDI mode, or a 1080p 10-bit 4:2:2 progressive scan video feed operating at a 50.00 or 59.94 Hz when in 3GHz HD-SDI mode.

The HD-SDI output may be specified as a PROGRAM output (clean feed video) or as a PREVIEW output (includes SurroundView™ look around, Clip Name, Timecode and Safe Action / Safe Title frame guides).

In addition to video, the HD-SDI output also provides two channels of embedded audio, Time of Day and Edge timecode, record Tally flag and Clip Name information as SMPTE RP-188 VITC2 HANC metadata.

NOTE: Default setting is PROGRAM.

NOTE: HD-SDI video output is Progressive Scan; it does not support 1080i or 1080PsF modes.

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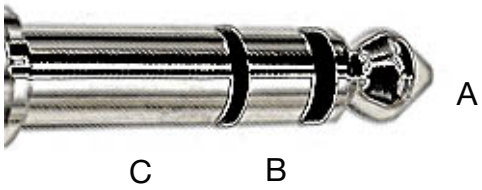
HEADPHONE

A 3.5mm stereo jack provides two channels of adjustable level analog audio for monitor headphones.



Headphone Output Connector

PIN	SIGNAL	DESCRIPTION	DIRECTION
A (TIP)	LEFT	Left channel audio	Out
B (RING)	RIGHT	Right channel audio	Out
C (SLEEVE)	GND	Camera ground	--

The camera's four audio channels may be monitored in pairs: either 1L - 2R or 3L - 4 R or as a quad mix of 1+3L – 2+4R based on the MIX parameter. Default is 1L-2R.

Output volume may be adjusted as follows.

Volume: (master volume) Adjusts headphone volume equally for left and right outputs.

Range is -18dB to 0dB in 1dB steps. Default is -9dB.

NOTE: for maximum output signal quality, only use high impedance headphones.

NOTE: in Version 3.x software the above selection is not available, the output is set to 1L / 2R.

SYNC (VIDEO SYNC)

A 4-pin LEMO connector supports shutter synchronization, GPI, timecode and genlock input signals.

The shutter Sync input signal acts as an immediate response hardware trigger to commence a scan. This is useful for motion control and other applications where the camera is driven by a master timing device. When using SYNC as the camera shutter timing reference, fine shutter start time timing (SHUTTER PHASE) is disabled; make any desired timing adjustments at the external SYNC generator.

Alternatively, this input may be used as a GPI (General Purpose Input) trigger, whose function is programmed in the USER KEYS menu. Default function for the GPI trigger is Record Start / Stop.

The SMPTE timecode input provides a frame accurate time stamp for each frame of recorded video. External TC must be chosen in the Project > Timecode menu. When SMPTE timecode is detected it will align the internal TC value to the external TC signal at every :00 frame crossing of the external TC signal.

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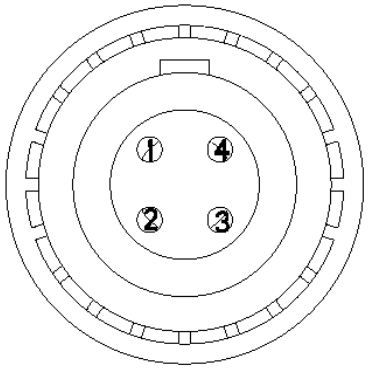
The Video Genlock input may be used as a vertical interval reference signal for the sensor and HD-SDI outputs when precise synchronization is required between cameras, such as for 3D and live broadcasts.

Note: When GENLOCK is selected as the sensor shutter reference, shutter start timing (SHUTTER PHASE) may still be adjusted. HD-SDI monitor outputs will automatically sync to the external GENLOCK signal as soon as it is detected, there is no need to enable this function. Sensor shutter sync to GENLOCK is only supported with HD-SDI.



View into camera SYNC (Video Sync) Interface connector

Mating Connector: FGG.00.304.CLAD27Z

PIN	SIGNAL	DESCRIPTION
1	GROUND	Common Ground
2	SS/GPI	Shutter Sync / GPI Trigger Input
3	TIMECODE	SMPTE unbalanced timecode Input
4	GENLOCK	RS170A Tri-Level Sync Input

NOTE: The Camera Brain's Shutter Sync / GPI Trigger uses a 3.3 V Schmitt trigger (5 V tolerant), current supplied by the trigger source. Both edges of the input signal may be used as a trigger.

For example, when GPI trigger is used for Record Start / Stop.

- **Start Record: On Ground to 3.3 V transition**
- **During Record: Hold at 3.3 V**
- **Stop Record: On 3.3 V to Ground transition**
- **During Stop: Hold at Ground**

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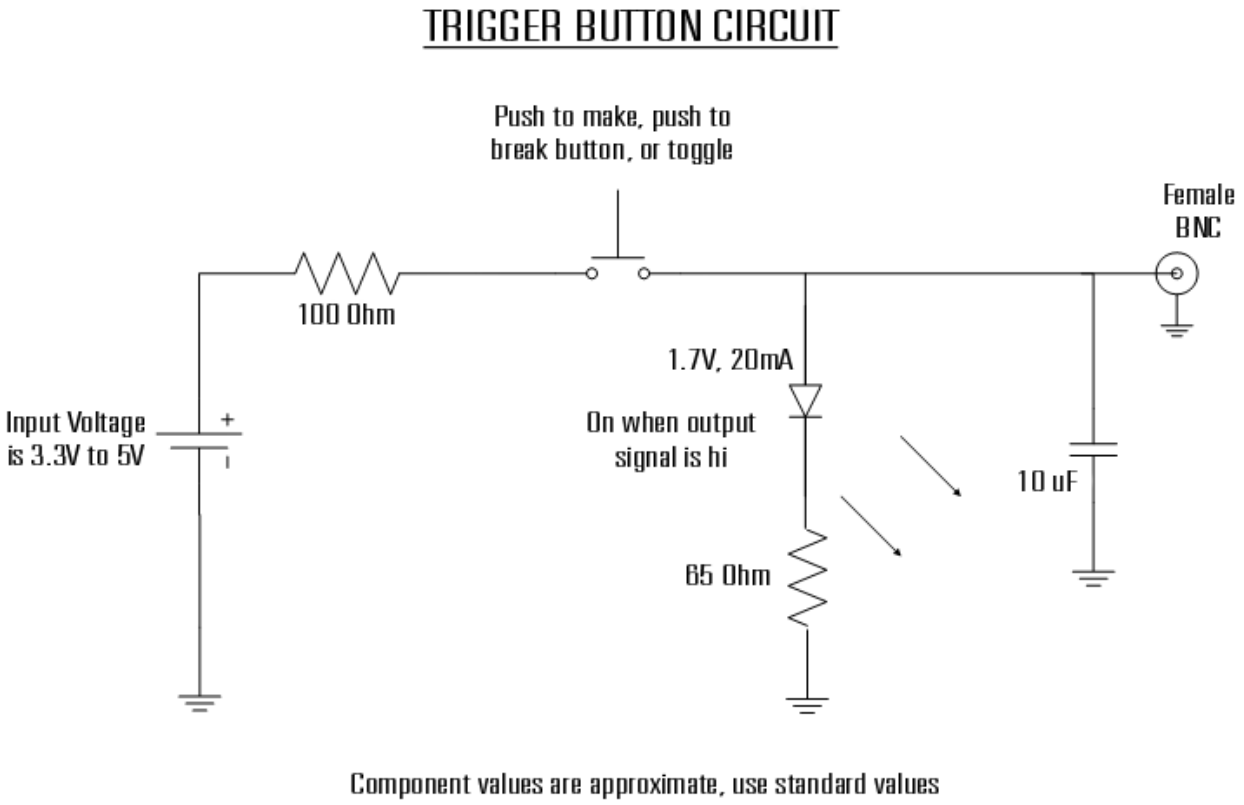

NOTE: A pre-fabricated SYNC interface cable is available from RED Digital Cinema.

- **P/N 790-0154 – Video Sync – Camera to 3 BNC – 3 ft. (1m)**
- **White BNC: Shutter Sync / GPI**
- **Yellow BNC: SMPTE Timecode**
- **Green BNC: RS170A Genlock**

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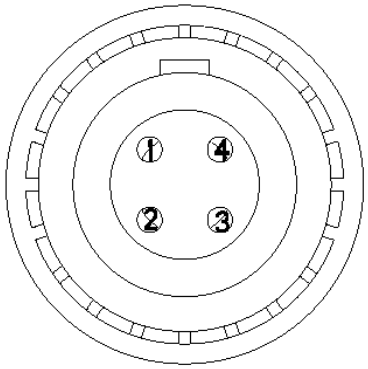
CTRL (RS232 CONTROL)

A 4-pin LEMO connector supports RS232 remote control for 3D camera communication, and third party metadata ingest applications.

The shutter Sync Output signal acts as an immediate response hardware tally of a scan. This is useful for 3D or motion control applications where a slave camera or lighting device needs to be synchronized to a master camera.

Alternatively, this output pin may be used as a GPO (General Purpose Output) tally, whose function is programmed in the USER KEYS menu. Default function for the General Purpose Output is Record Tally.



View into camera CTRL (RS232 Control) Interface connector

Mating Connector: LEMO FGG.00.304.CLAD27Z

PIN	SIGNAL	DESCRIPTION
1	GROUND	Common Ground
2	232 RX	RS232 RX
3	SS/GPO	Shutter Sync / GPO Output
4	232 TX	RS232 TX

NOTE: When active, the GPO tally presents 3.3V @ 0.04 Amps maximum between pins 1 and 3. When used as Sync Out, the rising edge of the pulse indicates start of exposure. When used as a Tally, the rising edge of the pulse indicates start of record, falling edge represents end of record.

NOTE: A pre-fabricated CTRL interface cable is available from RED Digital Cinema.

- **P/N 790-0152 – RS232 – Camera to DB-9 – 3 ft. (1m)**
- **DB-9 Pin 1: Shutter Sync / GPO**
- **DB-9 Pin 2: RS232 Tx**
- **DB-9 Pin 3: RS232 Rx**
- **DB-9 Pin 4: Ground**

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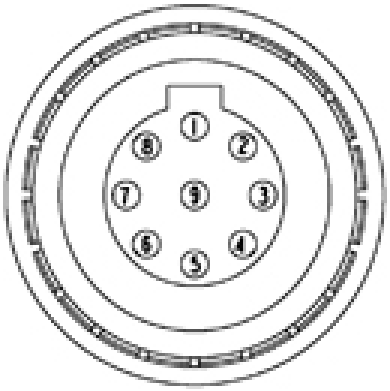
GIG-E (ETHERNET)

A 9-pin LEMO connector provides a Gigabit Ethernet port for remote camera setup, master / slave camera communication and external metadata ingest.



View into Ethernet Interface connector

Mating connector: *FGG.0B.309.CLAD32Z*

PIN	SIGNAL	DESCRIPTION	DIRECTION
1	B1_DC +	Data Pair C+	--
2	B1_DC -	Data Pair C-	--
3	B1_DD+	Data Pair D+	--
4	B1_DD -	Data Pair D-	--
5	B1_DA-	Data Pair A-	--
6	B1_DA+	Data Pair A+	--
7	B1_DB+	Data Pair B+	--
8	B1_DB-	Data Pair B-	--
9	-	Do Not Connect	--

NOTE: Two pre-fabricated Ethernet interface cables are available from RED Digital Cinema.

- **P/N 790-0163 – Ethernet – Camera to Camera – 3 ft. (1m)**
- **P/N 790-0159 – Ethernet – Camera to RJ45 – 3 ft. (1m)**

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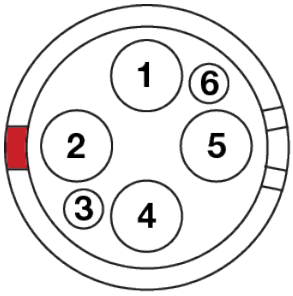
DC IN (POWER INPUT)

The 6-pin LEMO connector accepts DC input power between +11.5 V and +17 V DC. Power conditioning provides protection against reverse-polarity connection, ESD, under and over voltage, and over current.



View into camera DC IN Power Input connector

Mating Connector: LEMO FGJ.1B.306.CWLD72Z

PIN	SIGNAL	DESCRIPTION
1	+VBATT	Power input, +11.5 to +17 V DC
2		
3	SCL-BATT	Serial Battery Bus Clock
4	GROUND	Power Return (Camera Ground)
5		
6	SCA-BATT	Serial Battery Bus Data

WARNING: It is very important that both pairs of +VBATT and GROUND pins are wired up. DO NOT fabricate power cables with just one each of +VBATT and GROUND pins wired, as this may cause damage to the camera's power supply; this is not covered by Warranty.

NOTE: Two pre-fabricated DC Power input cables are available from RED Digital Cinema.

- **P/N 790-0138 – DC Power – REDBRICK® QUICKPLATE to Camera – 18 in. (0.5m)**
- **P/N 790-0164 – DC Power – XLR to Camera – 10 ft. (3m)**

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HDMI OUT

The HDMI output supports an HDTV and PC monitor compatible 10-bit 4:2:2 progressive scan video signal (with embedded audio) at 720p and 1080p resolution.

The HDMI output may be specified as a PROGRAM output (clean feed video) or as a PREVIEW output (including SurroundView™ look around, Clip Name, Timecode and Safe Action / Safe Title frame guides).

In addition to video data, the HDMI output also provides 4 channels of embedded audio.

NOTE: Default setting is PREVIEW.

NOTE: HDMI video output is Progressive Scan; it does not support 1080i or 1080PsF modes.

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SIDE SSD MODULE

A	SSD Slot
B	VIEWFINDER (LCD/EVF)

Side SSD Module

The Side SSD Module mounts to the left side of the camera Brain. On the rear face of this module is a slot for inserting a REDMAG 1.8"SSD digital Magazine. Do not attempt to insert any other media type, or any foreign objects into this slot, as damage to the Side SSD Module and / or the camera Brain may occur.

The VIEWFINDER output Module on the front face of the Side SSD Module provides digital video, communications and power interconnection between the camera and a RED EVF or RED LCD digital display. Due to the requirement for absolute data integrity this requires a custom cable manufactured by RED, the pin-out of this interface is not published.

NOTE: Pre-fabricated EVF / LCD cables are available from RED Digital Cinema.

- **P/N 790-0157 – EVF / LCD Cable – Right Angle to Right Angle – 6 in. (0.15m)**
- **P/N 790-0153 – EVF / LCD Cable – Right Angle to Straight – 18 in. (0.5m)**

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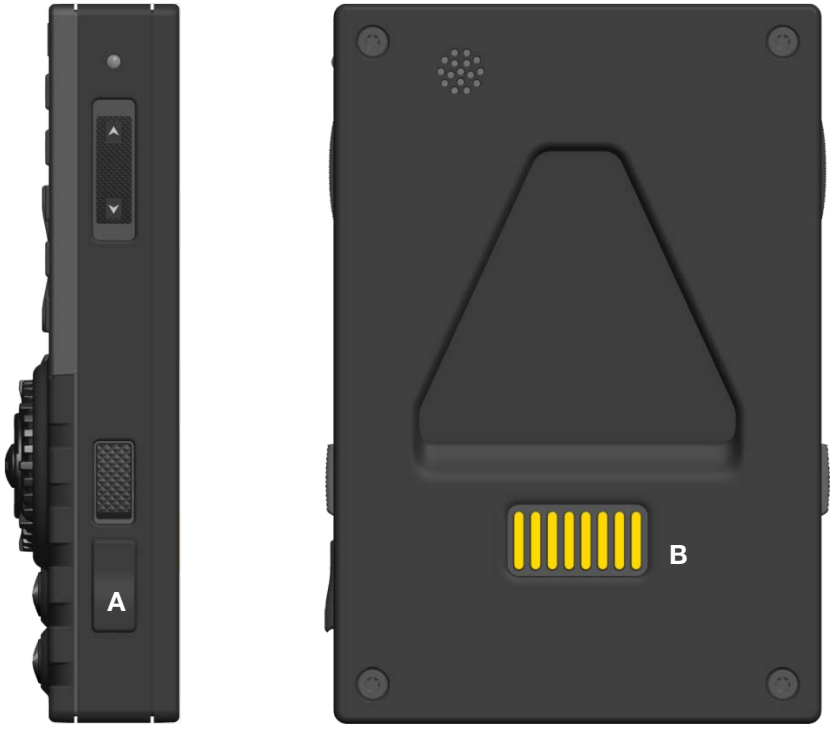
REDMOTE

This section describes the physical connectors on the REDMOTE.



A	Mini USB	**B**	Camera Interface

REDMOTE Connections

The REDMOTE interface connector allows communication between the REDMOTE and the camera Brain or any expansion module. Make sure these contacts are kept clean and free of any contaminants that may interfere with a reliable electrical contact.

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APPENDIX D: DEFAULT KEY FUNCTIONS

CAMERA BRAIN			
KEY	**FUNCTION**	**KEY**	**FUNCTION**
Record Half Press	Key Disabled-	Record Half Release	-Key Disabled-
Record Full Press	Record: Toggle		
SIDE HANDLE			
KEY	**FUNCTION**	**KEY**	**FUNCTION**
User A Press	AF Mode: Cycle	User B Release	-Key Disabled-
User B Press	WB: Auto Calc	User C Release	-Key Disabled-
User C Press	Magnify: Toggle	User D Release	-Key Disabled-
User D Press	Exposure Check: Toggle	User 1 Release	-Key Disabled-
User 1 Press	Slot: Set ISO	User 2 Release	-Key Disabled-
User 2 Press	Slot: Set Aperture	User 3 Release	-Key Disabled-
User 3 Press	Slot: Set Shutter	User 4 Release	-Key Disabled-
User 4 Press	Slot: Set Color Temp	User 5 Release	-Key Disabled-
User 5 Press	Exposure Check: Toggle	User 6 Release	-Key Disabled-
User 6 Press	-Key Disabled-	User 7 Release	-Key Disabled-
User 7 Press	Eject Media	User 1+4 Release	-Key Disabled-
User 1+4 Press	SH: Toggle Key Lock	Record Half Release	-Key Disabled-
Still Select	Focus Mode: Still	Record Full Release	-Key Disabled-
Movie Select	Focus Mode: Motion	Backlight Release	-Key Disabled-
Record Half Press	AF: Start	Nav Menu Release	-Key Disabled-
Record Full Press	Record: Toggle	Nav North Release	-Key Disabled-
Backlight Press	SH: Toggle Backlight	Nav South Release	-Key Disabled-
Nav Menu Press	Navigation: Menu	Nav East Release	-Key Disabled-
Nav North Press	Navigation: Up	Nav West Release	-Key Disabled-
Nav South Press	Navigation: Down	Nav Enter Release	-Key Disabled-
Nav West Press	Navigation: Right	Rocker + Release	-Key Disabled-
Nav East Press	Navigation: Left	Rocker - Release	-Key Disabled-
Nav Enter Press	Navigation: Select	Rotary Front CW	Navigation: CW
Rocker + Press	Iris: Open	Rotary Jog CW	Navigation: CW
Rocker - Press	Iris: Close	Rotary Front CCW	Navigation: CCW
User A Release	-Key Disabled-	Rotary Jog CCW	Navigation: CCW

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SIDE SSD MODULE			
KEY	**FUNCTION**	**KEY**	**FUNCTION**
User 1 Press	-Key Disabled-	User 1 Release	-Key Disabled-
User 2 Press	-Key Disabled-	User 2 Release	-Key Disabled-
User 1+2 Press	Eject Media	Record Half Release	-Key Disabled-
Record Half Press	AF: Start	Record Full Release	-Key Disabled-
Record Full Press	Record: Toggle		
REDMOTE			
KEY	**FUNCTION**	**KEY**	**FUNCTION**
User A Press	AF Mode: Cycle	Nav Enter Press	Navigation: Select
User B Press	RAW Check: Toggle	Rocker + Press	Iris: Open
User C Press	Magnify: Toggle	Rocker - Press	Iris: Close
User D Press	Exposure Check: Toggle	Rotary CW	Navigation: CW
Still Select	Focus Mode: Still	Rotary CCW	Navigation: CCW
Movie Select	Focus Mode: Motion	User A Release	-Key Disabled-
Record Half Press	AF: Start	User B Release	-Key Disabled-
Record Full Press	Record: Toggle	User C Release	-Key Disabled-
Nav Menu Press	Navigation: Menu	User D Release	-Key Disabled-
Nav North Press	Navigation: Up	Record Half Release	-Key Disabled-
Nav South Press	Navigation: Down	Record Full Release	-Key Disabled-
Nav East Press	Navigation: Right	Rocker + Release	-Key Disabled-
Nav West Press	Navigation: Left	Rocker - Release	-Key Disabled-
DISPLAY (BRAIN)			
KEY	**FUNCTION**	**KEY**	**FUNCTION**
LCD User 1 Press	Magnify: Toggle	LCD Down Arrow Press	Decr. LCD Brightness
LCD User 2 Press	Exposure Check: Toggle	EVF User 1 Press	Magnify: Toggle
LCD Up Arrow Press	Incr. LCD Brightness	EVF User 2 Press	Exposure Check: Toggle

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APPENDIX E: REDMOTE OPERATION

CONTROL, CONNECTORS AND DISPLAY

This section describes the REDMOTE physical controls, connectors and color LCD display.

CONTROLS

REDMOTE Controls

A	Stills/Motion Switch	**F**	User Function Keys A-D	**K**	Menu Buttons 4-8
B	Release Latch - Left	**G**	MENU Button	**L**	Power/Lock Switch
C	Record Status LED	**H**	Menu Buttons 1-3	**M**	Release Latch – Right
D	Wireless Status LED	**I**	Navigation Group	**N**	USB External Power Port
E	Zoom Rocker Switch	**J**	Focus / Record Button		

STILL / MOTION SWITCH

The STILLS/MOTION toggle switch is used to switch between STILLS operation (DOWN) and MOTION operation (UP). When the toggle switch is set to the MOTION position, all camera settings and defaults are movie specific. When the toggle switch is set to the STILLS position, all camera settings and defaults are stills photography specific.

Note: In Version 3.x software the STILLS/MOTION switch is disabled. Default mode is MOTION.

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LEDS

There are two status LED indicators located above the rockers switch on the left side of the LCD display.

The upper LED is used to signal camera readiness and camera record status.

- Red – Camera Startup / Camera Recording.

The lower LED is used to signal camera readiness and REDMOTE communication status to the camera.

- Green – Camera Ready / REDMOTE connected.
- Blinking Green – Searching / Establishing communication

ROCKER SWITCH

The function of the pressure sensitive ROCKER SWITCH may be assigned by the operator to one of a number of operational controls. Refer to SECONDARY MENUS > SETTINGS > SETUP > KEYS / SHORTCUTS.

USER FUNCTION KEYS

The function of each User Function Key may be assigned by the operator to one of a number of operational controls. Refer to SECONDARY MENUS > SETTINGS > SETUP > KEYS / SHORTCUTS.

Default settings for User Function Keys A-D are as follows:

- User Key A – Toggles Auto Focus
- User Key B – Toggles View RAW
- User Key C – Toggles Focus Check (1:1 Magnify)
- User Key D – Toggles Sensor RAW Exposure Check

MENU BUTTON

Below and to the left of the User Keys is the MENU button, press to switch between primary level and secondary level Camera menus. When in Camera menus or REDMOTE menus, press once to exit menus.

SOFT MENU BUTTONS 1-3

Below the LCD are three Soft Menu Buttons, whose specific functions are indicated by the LCD screen. For complete information refer to OPERATION > REDMOTE MENUS > SOFT MENU BUTTONS 1-3.

NAVIGATION GROUP

The Navigation Group allows navigation of the camera menus and adjustment of selected parameters.

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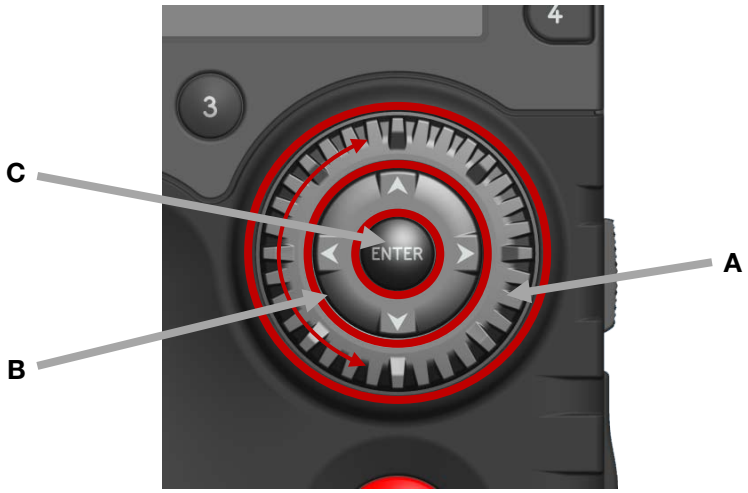

REDMOTE Navigation Group

A	Scroll Wheel	**B**	Direction Keys	**C**	Enter Button

The Navigation Group has three separate operational capabilities.

SCROLL WHEEL

The Scroll Wheel allows the operator to select and adjust the values of selected camera parameters.

DIRECTION KEYS

The Direction Keys allows Left / Right / Up / Down navigation thru the camera menus to select a desired parameter for adjustment.

ENTER BUTTON

The Enter button allows confirmation of a parameter adjustment or operational mode selection.

FOCUS AND RECORD BUTTON

Below the Navigation Group is the focus and record button. A half press initiates Auto Focus; a full press initiates Stills capture or starts /stops a Movie recording.

When recording, the upper LED will illuminate Red and the Timecode readout on the REDMOTE LCD will also display in red colored text.

Note: In Version 3.x software the frame count of the Timecode is not displayed. This is normal and does not indicate an error.

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SOFT MENU BUTTONS 4-8

To the right of the LCD are five Soft Menu Buttons. These buttons select a variety of camera status pages. For complete information refer to OPERATION > REDMOTE MENUS > SOFT MENU BUTTONS 4-8.

Note: In Version 3.x software, Soft Menu Buttons 7 and 8 are undefined.

POWER / KEY LOCK SWITCH

If the REDMOTE is powered OFF, moving and holding the switch in the down (POWER) direction for 2 seconds will power UP the REDMOTE and if the REDMOTE is powered ON, moving and holding the switch in the down (POWER) direction for 5 seconds will power DOWN the REDMOTE.

Moving the switch to the up (LOCK) position will lockout all REDMOTE buttons to prevent unintentional operation. When in the LOCK position, KEYS LOCKED will be displayed in red text above the SOFT MENU BUTTONS 1-3 on the REDMOTE LCD display.

USB POWER PORT

The USB port may be used to charge the REDMOTE internal battery from a suitable USB power source. Refer to CHARGING / BATTERY LIFE > CHARGING USING USB CONNECTOR for complete information.

OPERATION

DOCKING AND UNDOCKING

This section describes how to physically dock / undock the REDMOTE to / from the camera Brain or the back of the rearmost expansion module.

DOCKING

1. Place the female V-Mount of the REDMOTE over the male V-Mount of the camera Brian or rearmost module.

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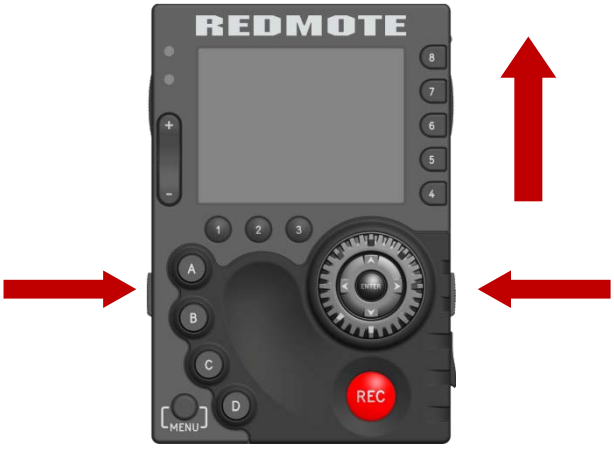
Note: For illustration only: rear surface of REDMOTE should face towards camera

2. Slide the REDMOTE down until a click is heard which indicates the REDMOTE is securely attached.

UNDOCKING

1. Depress the two latch release buttons located on each side of the REDMOTE.
2. Slide the REDMOTE upward to release from the V-Mount of the camera Brain / rear most module.
3. Remove the REDMOTE.



POWER UP / DOWN

Located on the upper right side of the REDMOTE is the Power / Key Lock Switch (refer to CONTROLS).

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POWER UP

CONNECTED TO CAMERA

If the REDMOTE is physically attached to a camera, when the camera is powered up the REDMOTE will automatically power up along with the camera.

NOT CONNECTED TO CAMERA

To manually power up the REDMOTE, slide and hold the Power / Key Lock Switch in the down direction for 2 seconds, then release.

POWER DOWN

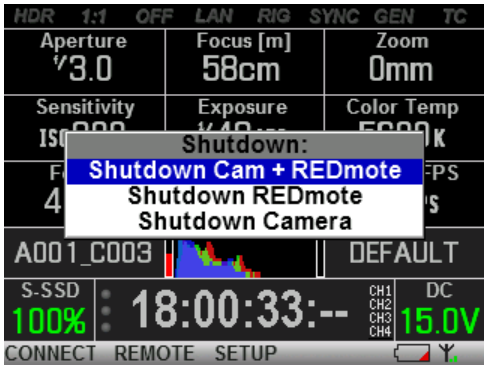
USING CAMERA

When REDMOTE is connected to the camera and the camera is powered down, the REDMOTE will also power down. When disconnected from the camera, the REDMOTE will not power down with the camera.

USING REDMOTE

To power down REDMOTE, slide and hold the Power / Key Lock Switch in the down direction for 5 seconds.

Or slide and hold the Power / Key Lock Switch in the down direction momentarily, then release. A screen will display with options to power down the REDMOTE, the Camera, or REDMOTE and Camera together. Select the desired option and press the ENTER key in the REDMOTE Navigation Group.



NOTE: Wireless mode shown. When docked to camera, SHUTDOWN CAMERA is not displayed.

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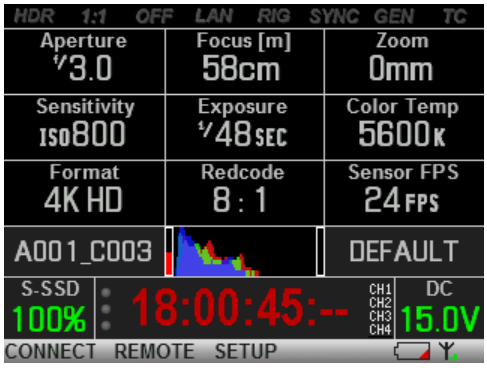
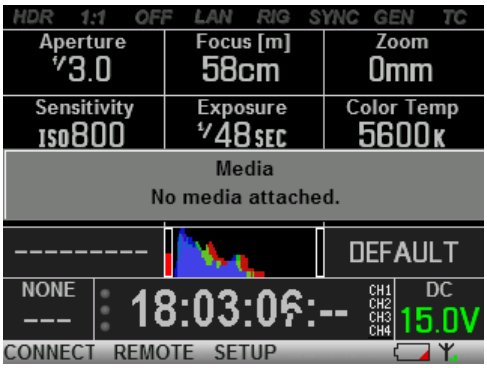
RECORDING

- To record, press the Red REC (record) button. If media is connected and properly formatted, the upper LED will illuminate Red and the Timecode value displayed in the LCD will change to Red text.



To stop recording, press the REC button a second time. After recording to media is completed, the upper LED will go out and the Timecode value displayed in the LCD will change back to White text.

Note: If media is NOT connected when record is requested, the REDMOTE LCD and camera VIEWFINDER (MENUS) output will indicate "NO MEDIA ATTACHED".



ACCESSING CAMERA CONTROLS / SETTINGS

The Navigation Group is used to navigate through camera menus. Refer to CAMERA OPERATIONAL CONTROLS > REDMOTE > NAVIGATION GROUP. The camera settings and status are displayed on the REDMOTE LCD. Refer to BASIC OPERATION > GRAPHICAL USER INTERFACE AND NAVIGATION > REDMOTE.

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CHANGING CAMERA SETTINGS

USING CAMERA LCD / EXTERNAL MONITOR AS REFERENCE

To adjust a parameter value displayed on the camera's Upper Status Group, first note the red colored bar (located under 24fps in this example), indicating the currently active parameter for instant adjustment.

Use the NAVIGATION GROUP directional pad to move the cursor to a different parameter if desired, then press the ENTER key to select that parameter and use the Scroll Wheel to adjust that parameter's value. To confirm the change in parameter value and to exit the adjustment menu, press the ENTER button.

To access the camera's menus, press the MENU button at the lower left. The MENU displays on the EVF, LCD or external monitors if the LCD and/or EVF are not connected disconnected.

Use the NAV GROUP to make changes to the cameras settings. Use the scroll wheel and directional pad to move the cursor to navigate and make changes to the desired settings. When a desired setting change is made, press the ENTER button or the directional pad UP arrow to exit from that setting.

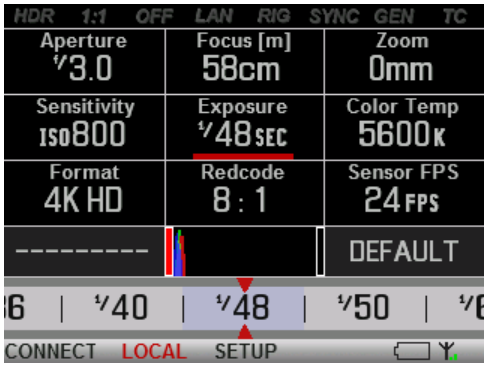
Exiting Menus to Main Screen

To EXIT from the Secondary Menus and return to the main screen:

- Press the MENU button until the main screen is displayed.

USING REDMOTE LCD STAND-ALONE

The LOCAL function of the REDMOTE allows you to adjust the camera settings from the REDMOTE while observing the parameters directly on the REDMOTE LCD as opposed to on the camera LCD or an external monitor. For complete details refer to REDMOTE MENUS > SOFT MENU BUTTONS 1-3 > 2 REMOTE > LOCAL.



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ADVANCED OPERATION: REDMOTE MENUS

SOFT MENU BUTTONS 1-3

Located below the main LCD display are three Soft Menu Buttons, who access advanced function menus identified by text in the LCD directly above the corresponding button. These menus control wireless connection (CONNECT), camera or local menus (REMOTE/LOCAL) and system setup (SETUP).

WIRELESS CONNECT: SOFT MENU BUTTON 1

Note: This Button is hidden if REDMOTE is attached to the camera or rear-most camera module.

Note: If a REDMOTE has previously been successfully paired with a camera, and the REDMOTE has scanned the wireless network and found that camera, the following operation can be bypassed as the REDMOTE will auto scan and connect to that camera each time it is powered ON and undocked.

CONNECT REDMOTE TO A PAIRED CAMERA

NOTE: The following procedure assumes the camera has already been paired and named DEFAULT under the camera's SETTINGS > SETUP >REDMOTE and COMMUNICATION menus.

1. Press CONNECT to initiate a scan by the REDMOTE for available paired cameras in wireless range.

2. If the REDMOTE fails to find a camera it has been paired with the following screen will be displayed. Select RESCAN and press the ENTER button in the Navigation Group to force a second scan for paired cameras in wireless range. A wireless scan typically takes 20-30 seconds.

3. When REDMOTE finds a camera or cameras it has been paired with in wireless range, the name of the available camera or cameras will be displayed - for example a single camera named DEFAULT.

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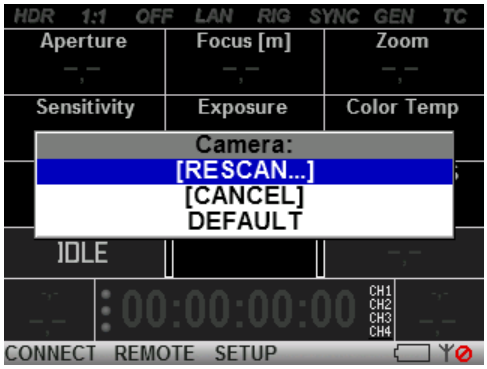
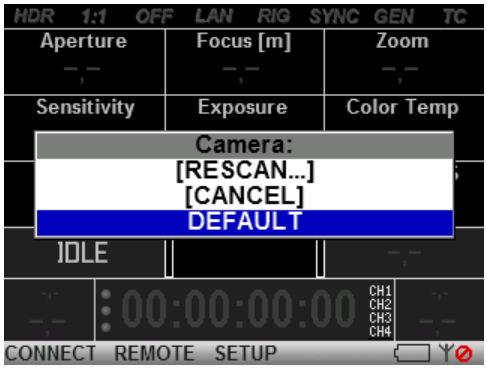
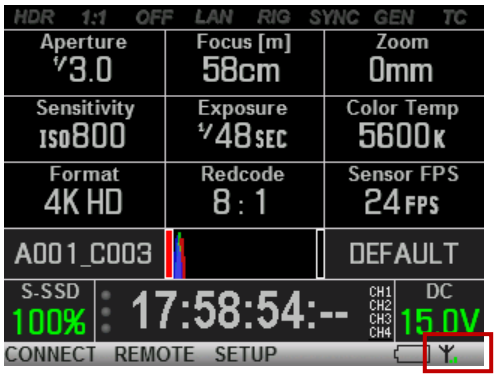


4. Select the desired camera to connect to for REDMOTE wireless operation and press the ENTER button in the Navigation Group. The REDMOTE will connect to the selected camera.



5. Once connected, the REDMOTE will display the key operating parameters of the selected camera. The wireless signal strength will be shown in the lower Right corner of the REDMOTE screen.



The camera VIEWFINDER monitor output will confirm REDMOTE is wireless connection by displaying RM and a signal strength icon in Green on the Lower Status Group.

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Note: Once this procedure has occurred once, the REDMOTE will automatically search for the camera each time it is undocked, until the paired camera selection is changed.

CANCEL

If you wish to exit the CONNECT menu at any time press CANCEL.

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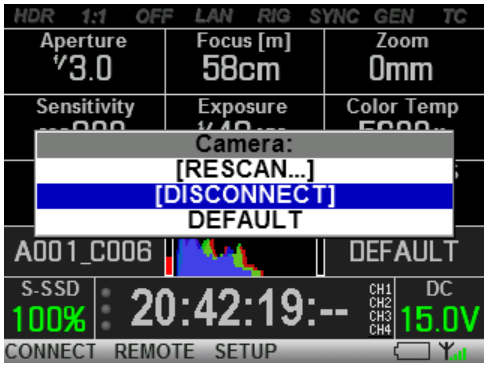
DISCONNECT

To stop communicating wirelessly with the camera, select Soft Menu Button 1 Connect, then select DISCONNECT and press the ENTER key in the Navigation Group.



RECONNECTING IF SIGNAL IS LOST

On loss of wireless communication REDMOTE will scan for the camera it was last paired with.

If the REDMOTE is unable to re-connect after 30 seconds, it will enter the manual SCAN menu, follow the procedure outlined about to scan and identify camera(s) that you wish to connect to.

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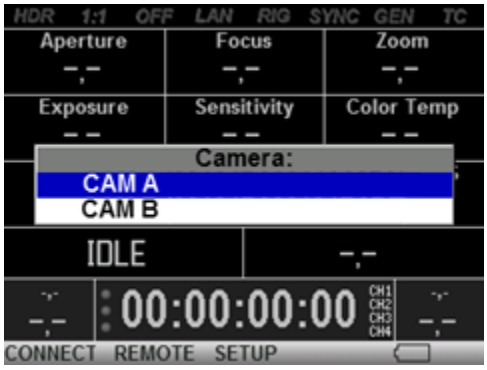
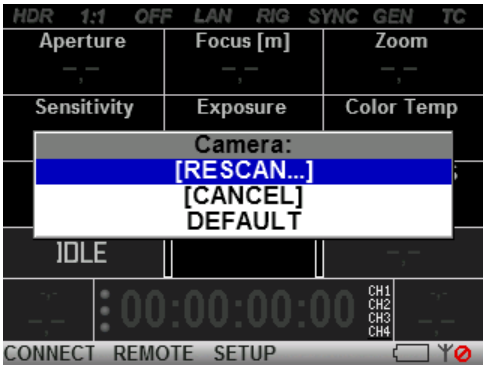
OPERATING WITH MULTIPLE CAMERAS FROM A REDMOTE

To control more than one camera from a single REDMOTE, first pair the REDMOTE with each camera. After pairing REDMOTE to the desired cameras, press Soft Menu Button 1: CONNECT. Available cameras will be listed.

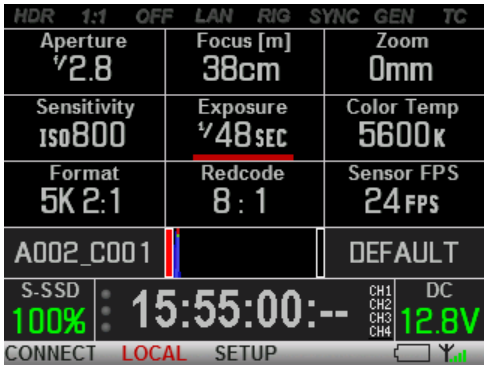


Select the camera you wish to control and press the ENTER button. When you want to switch to a different camera, press Soft Menu Button 1: CONNECT again to list available cameras and re-select.



REDMOTE OR LOCAL MENUS: SOFT MENU BUTTON 2

When selected allows the user to toggle the REDMOTE between REMOTE and LOCAL menus.



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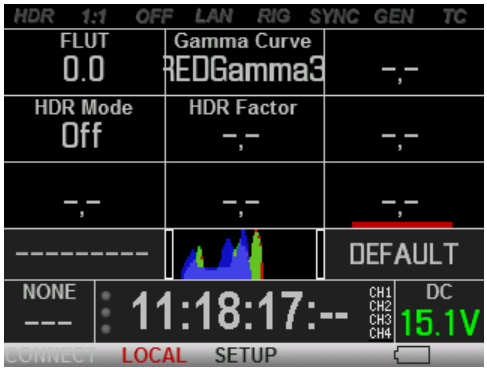
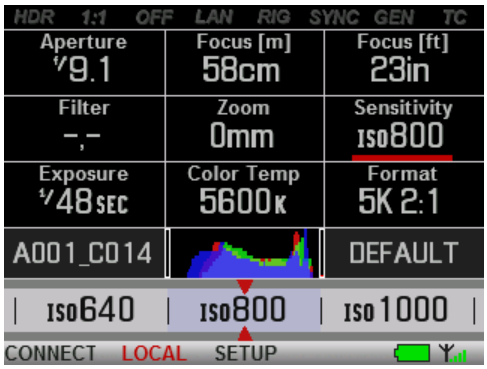
REMOTE

Allows the user to adjust camera settings from REDMOTE, by navigating the camera menus appearing on the VIEWFINDER output of the camera, with summary data only appearing on the REDMOTE LCD



LOCAL

Allows the user to adjust camera settings from REDMOTE, by navigating camera menus appearing on the REDMOTE LCD, with summary data only appearing on the VIEWFINDER output of the camera.



CUSTOMIZING LOCAL MENUS.

When operating in LOCAL mode, REDMOTE provides the user the option to configure which parameters to display in each of the parameter status windows. You can assign the parameters to one of the 5 pages of information available under Soft Menu Buttons 4-8.

To customize parameters:

1. Ensure camera is ON and wirelessly connected to REDMOTE.
2. If Soft Menu Button 2 reports as REMOTE, press it once so it reports LOCAL.
3. Select the Soft Menu Button page you would like to set the parameter on from the right hand side of the LCD. Refer to SOFT MENU BUTTONS 4-8.
4. Use the directional arrows on the Navigational Control to move the Red cursor to the desired location within that page to place the parameter.
5. Now press SETUP: Soft Menu Button 3.

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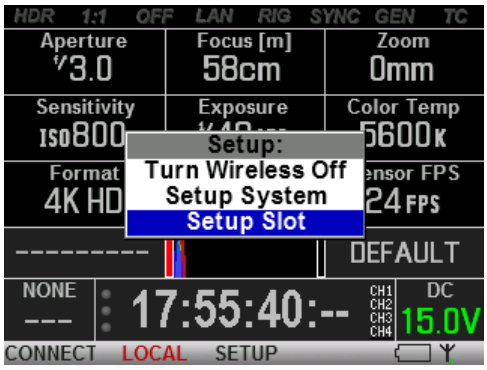
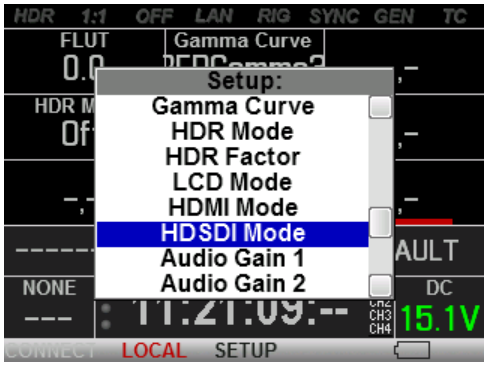
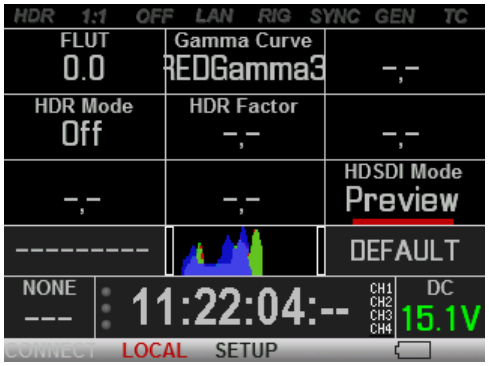
6. Select “Setup Slot” and press the ENTER button.



7. A new Setup window will appear displaying available parameters to display.



8. Select the desired parameter and press the ENTER button.



9. You may now control this parameter directly from the REDMOTE.

REDMOTE SETUP: SOFT MENU BUTTON 3

When pressed, SETUP provides the option of forcing the REDLINK wireless link ON or OFF and selecting the following REDMOTE Setup menu.

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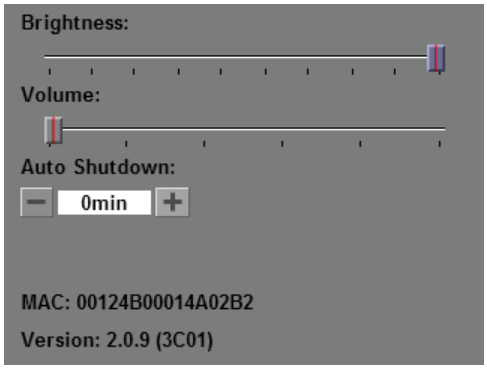


Adjustable parameters include LCD screen brightness; beep speaker Volume and Auto Shutdown time. In the lower section of the display is the MAC address and the current firmware build of the REDMOTE

Brightness

The BRIGHTNESS control adjusts the LCD backlight intensity. Set value to maximum for daylight visibility, set value lower for nighttime operation or for maximum battery run time when operating in wireless mode.

Default value is Maximum.

Volume

The VOLUME control adjusts the loudness of the beep speaker. As you adjust this value the REDMOTE will beep the speaker to give an audible confirmation of the selected volume. Default value is Minimum.

Auto Shutdown

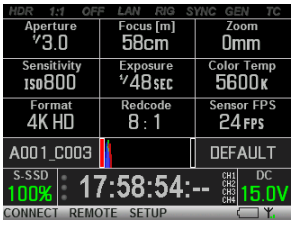
The AUTO SHUTDOWN control adjusts the amount of time a REDMOTE will continue to operate when in the wireless mode after no detected activity (i.e. no button presses are detected) before powering down.

Default value is OFF (REDMOTE will operate continuously until manually powered down.)

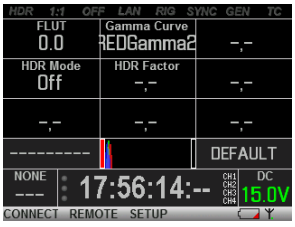
DISPLAY LAYOUT: SOFT MENU BUTTONS 4-8

To the right of the LCD are five Soft Menu buttons 4-8. These buttons select between a variety of camera status page layouts.

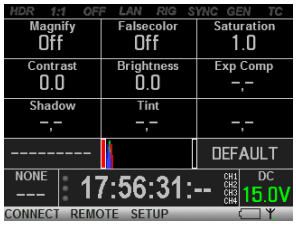
Note: In Version 3.x software, buttons 7 and 8 are undefined.



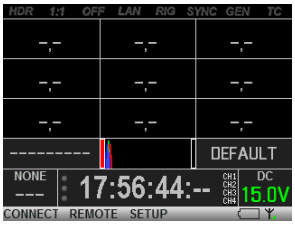
Menu Button 4



Menu Button 5



Menu Button 6



Menu Button 7 & 8

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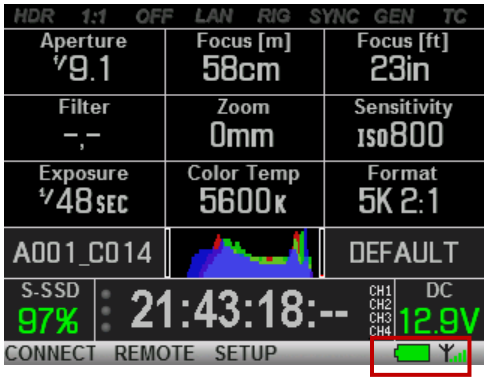
MAINTENANCE

INTERNAL BATTERY

CHARGE STATUS

An icon shows the charge status of the REDMOTE battery in the lower right corner of the LCD.



When REDMOTE is operating in wireless mode, the icon indicates current charge capacity. When satisfactory the icon is displayed in Green. When battery charge becomes marginal, the icon turns Yellow. When battery charge is critically low, and wireless communication is at risk of being lost the icon turns Red. The REDMOTE should be re-attached to the camera or rearmost module, or be attached to a suitable USB power source, to recharge the battery before re-attempting wireless operation.

When attached to the camera or rearmost camera module, or external USB power source, this icon will either display solid green, indicating fully charged, or blink, indicating the battery is being charged by the camera or external USB power source.

BATTERY LIFE

When using the REDMOTE in wireless configuration, the battery will last approximately 8 hours before charging is necessary.

NOTE: When not using the REDMOTE, for maximum battery storage life, use the Power / Lock Switch to power down the REDMOTE completely by pressing down in the power off position and using the displayed menu to shut down the REDMOTE and/or the REDMOTE and camera. Refer to POWER UP / DOWN > POWER DOWN. If the Power / Lock Switch is pressed down in the power off position and held until the REDMOTE powers down, the battery storage life will be reduced greatly as there will be a slight power draw on the REDMOTE when shut down using this procedure.

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CHARGING

CHARGE TIME

A fully discharged REDMOTE battery will be fully charged in approximately 6 hours.

USING CAMERA

While connected to the camera, the REDMOTE will automatically recharge its internal battery. Charge status is indicated by the Green Battery Icon at the top-right of the REDMOTE LCD display screen. A fully discharged REDMOTE battery will be re-charged in approximately 6 hours if connected to a powered camera or a USB based power source such as laptop P.C.

USING USB CONNECTOR

The REDMOTE can be charged by connecting the RED Mini-USB-to-USB cable (790-0230) between REDMOTE and a computer or a cell phone charger.

NOTE: The REDMOTE can be charged using the Mini-USB connector while connected and controlling a camera wirelessly.

NOTE: If the computer / cable / hub do not provide enough voltage, the REDMOTE will not charge and show an "Error Charging" message.

1. Connect the USB connector to any computer (computer must be ON to charge REDMOTE).
2. Connect the Mini-USB end to the REDMOTE USB Port located on the lower right side (under rubber protective cover).
3. If the REDMOTE is powered down (and paired camera is OFF), the REDMOTE will power UP, display STARTING UP, display SEARCHING (with flashing Green LED), then settle into IDLE mode.
4. Green battery indicator will blink, indicating REDMOTE is charging.
5. A fully discharged REDMOTE battery will be fully charged in approximately 6 hours.

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UPGRADING REDMOTE FIRMWARE

The REDMOTE update utility allows you to upgrade the firmware on your REDMOTE.

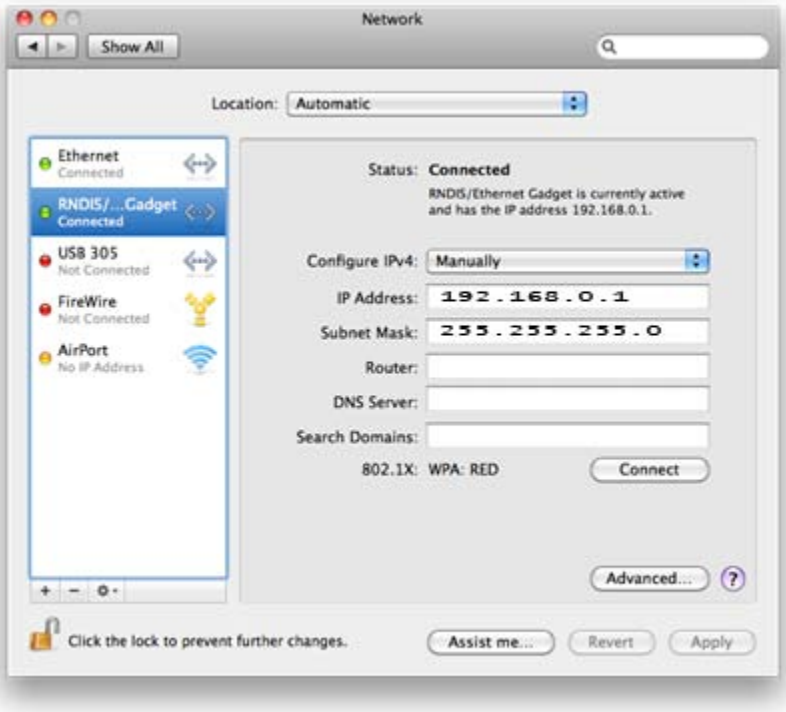
NOTE: After firmware has been upgraded, the REDMOTE must be paired to the camera again.

SETUP

CONFIGURING REDMOTE CONNECTION WITH COMPUTER (MAC)

The first step in upgrading REDMOTE firmware is to establish communication between the MAC and the REDMOTE.

1. Connect a USB to mini-USB cable between the computer and the USB connector on the REDMOTE.
2. Go to System Preferences and choose Network. This may open automatically when the REDMOTE is connected.
3. Look for a device called RNDIS/ ...Gadget.



4. Change Configure IPv4 setting to “Manually” (as shown).
5. In the IP Address field, enter 192.168.0.1 (as shown).
6. In the Subnet Mask field, enter 255.255.255.0 (as shown).
7. The Status should change to “Connected” after changes.

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NOTE: After entering the IP address as shown above you may not connect during the upgrade procedure. When you go back and check the IP address you see that it is 0.0.0.0 HOWEVER the status of the device is shown as "Connected".

If this is the case, you may need to enter the IP address a second or possibly a third time to make it stick.

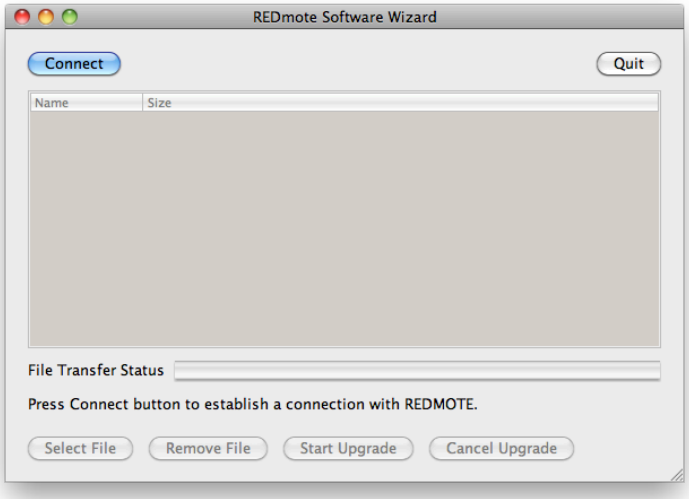
8. Click "Apply' at the bottom of the Network window.
9. Proceed to UPGRADING REDMOTE FIRMWARE.

UPDATING REDMOTE FIRMWARE

The following information will guide you through proper updating of your REDMOTE firmware.

MAC

1. Download the camera upgrade EPIC_vX.X.XX zip file located at **http://www.red.com/support**.
2. The file will unzip automatically when downloaded. The REDMOTE Upgrade is located in this download.
3. Navigate to the downloads folder and open the newly created EPIC_vX.X.XX folder; or open it directly from the downloads window.
4. Open the REDmoteUpgrade_vXXX folder.
5. Open the MAC folder.
6. Double-click the REDmoteUpgradeApp. A Terminal window will open and the REDMOTE Software Wizard will open.



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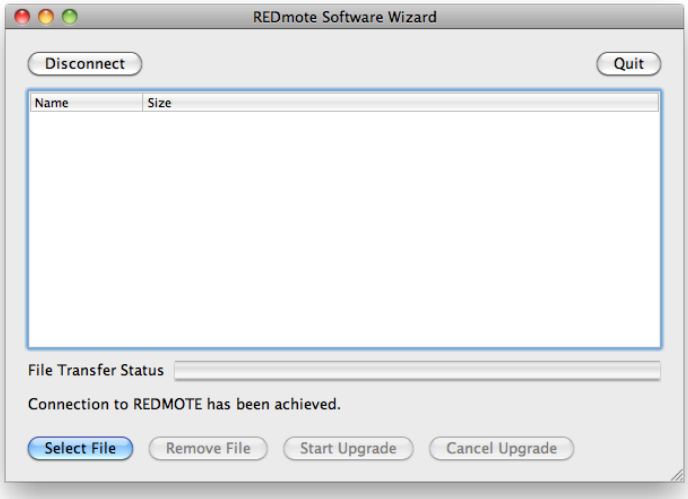
7. Click “Connect”. When REDMOTE has been established, “Connection to REDMOTE has been achieved” will be displayed.

NOTE: If REDMOTE does not connect, verify that the IP address set under CONFIGURING REDMOTE CONNECTION WITH COMPUTER (MAC) has held. If not, enter it again as outlined in the procedure.



8. Click "Select File" and navigate to the redmote.1.bin file located in the REDmote_firmware_vXXX folder.

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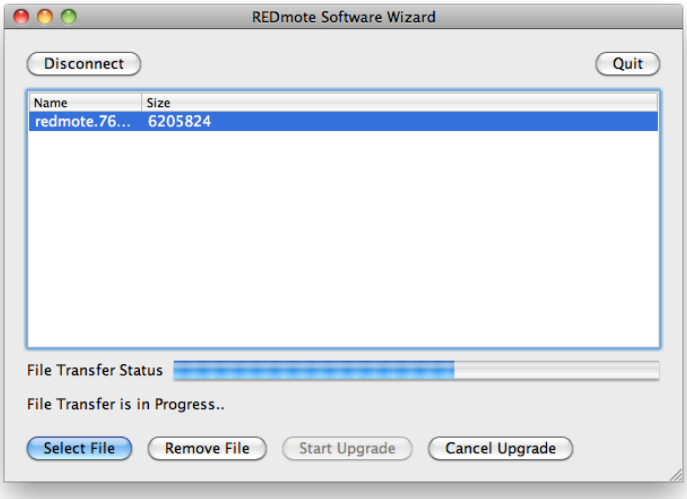
9. Select "Start upgrade".



10. File transfer status will be displayed as a Blue bar.

11. "Updating Firmware" will be displayed with a Green status bar showing upgrade progress. REDMOTE will also display UPGRADE during this process.

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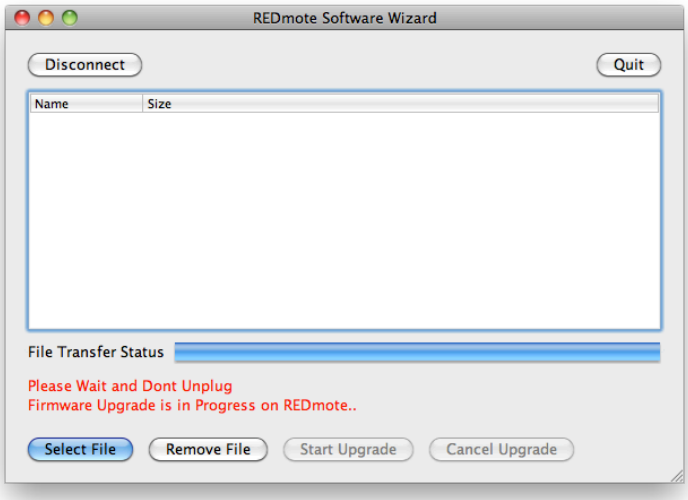
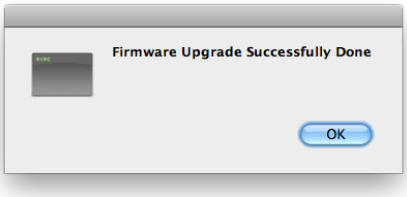
12. Once the File Transfer Status is completed, the REDMOTE Software Wizard will display “Please Wait and Don’t Unplug – Firmware Upgrade is in Progress on REDMOTE”.



13. After a few more seconds, the REDMOTE Software Wizard will display “Firmware Upgrade Successfully Done”. Select OK.



14. The REDMOTE Software Wizard will disconnect from the REDMOTE.
15. REDMOTE will reboot.
16. REDMOTE upgrade is complete. REDMOTE will display “POWER UP”, then “SEARCHING” once the upgrade has completed. Finally displaying “Camera: RESCAN…” and going into IDLE mode.

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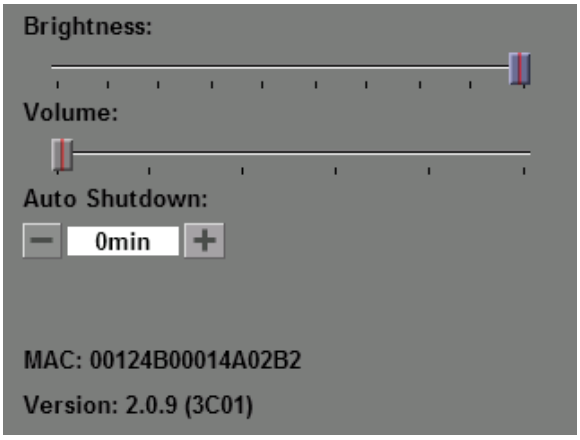
17. Verify the current REDMOTE firmware version by selecting SETUP > SETUP SYSTEM on the REDMOTE.



18. REDMOTE upgrade is complete. You can now reconnect to the camera.

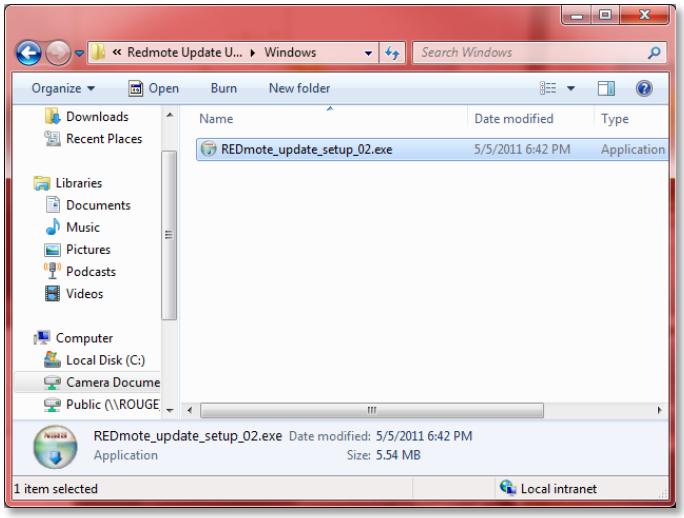
NOTE: Pairing of the REDMOTE may not be necessary after upgrading the REDMOTE firmware, however after upgrading the camera firmware, you must pair the REDMOTE again.

WINDOWS

Install Upgrade Utility

This procedure outlines installation of the REDMOTE Upgrade Utility for Windows computers.

1. Download the REDMOTE Update zip file to your desktop.
2. Uncompress the zip file.
3. Open the newly created folder.
4. Double-click on the REDMOTE_upgrade_setup.exe file to install the program.



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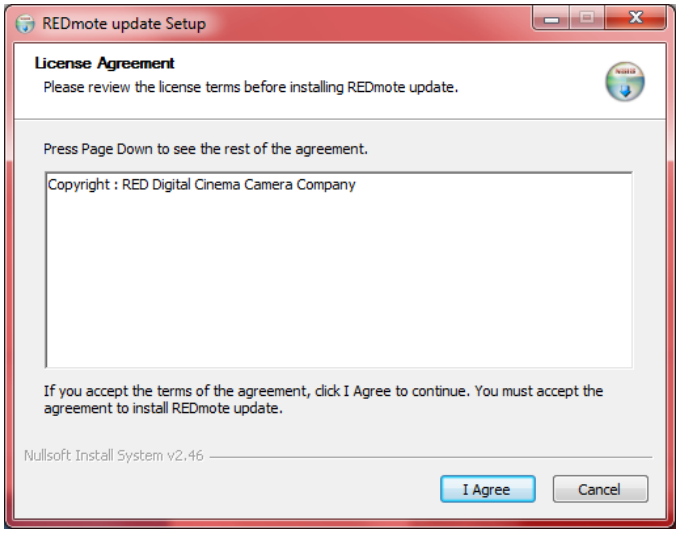
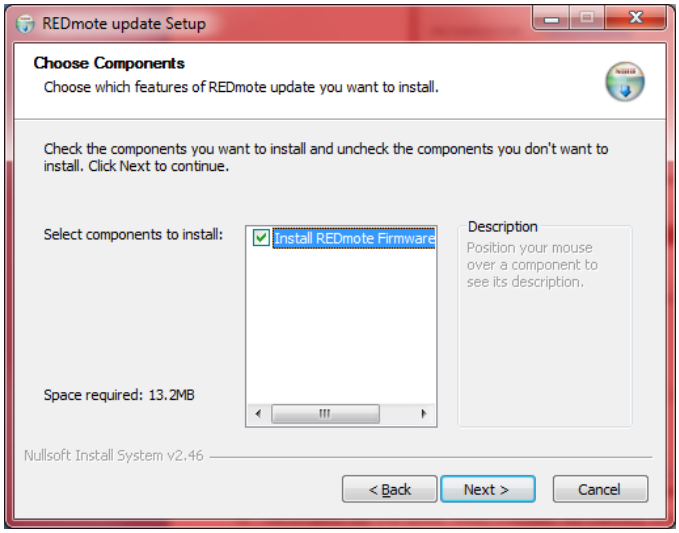
5. Select “I Agree” to the license agreement.


REDmote update Setup
License Agreement
Please review the license terms before installing REDmote update.
Press Page Down to see the rest of the agreement.
Copyright : RED Digital Cinema Camera Company
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install REDmote update.
Nullsoft Install System v2.46
I Agree
Cancel

6. On the Choose Components screen, select Install REDMOTE Firmware.
7. Select “Next”.


REDmote update Setup
Choose Components
Choose which features of REDmote update you want to install.
Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.
Select components to install:
Install REDmote Firmware
Description
Position your mouse over a component to see its description.
Space required: 13.2MB
Nullsoft Install System v2.46
< Back
Next >
Cancel

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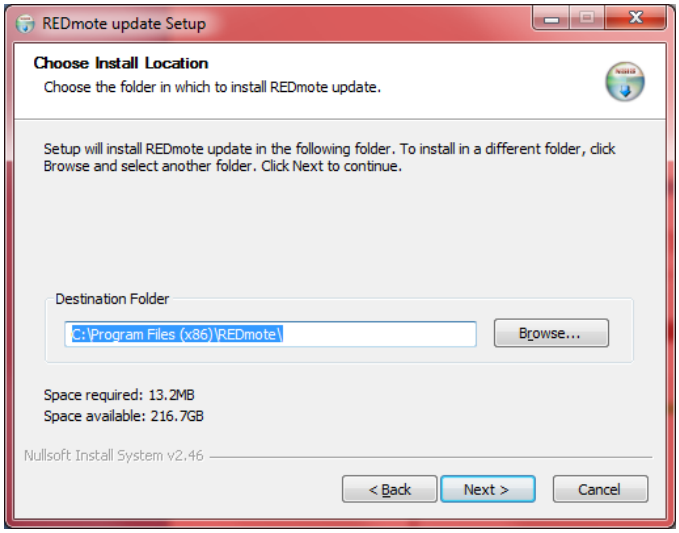
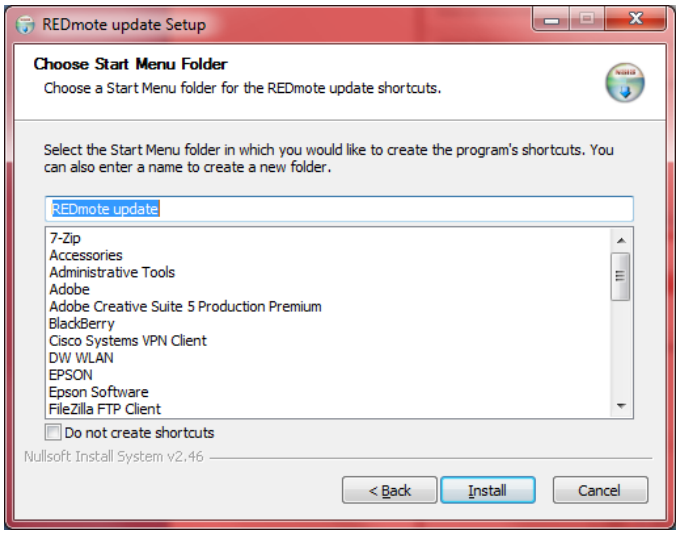
8. Choose location to install the REDMOTE Upgrade Utility .


REDmote update Setup
Choose Install Location
Choose the folder in which to install REDmote update.
Setup will install REDmote update in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.
Destination Folder
C:\Program Files (x86)\REDmote\
Browse...
Space required: 13.2MB
Space available: 216.7GB
Nullsoft Install System v2.46
< Back
Next >
Cancel

9. Choose the location for the shortcut.



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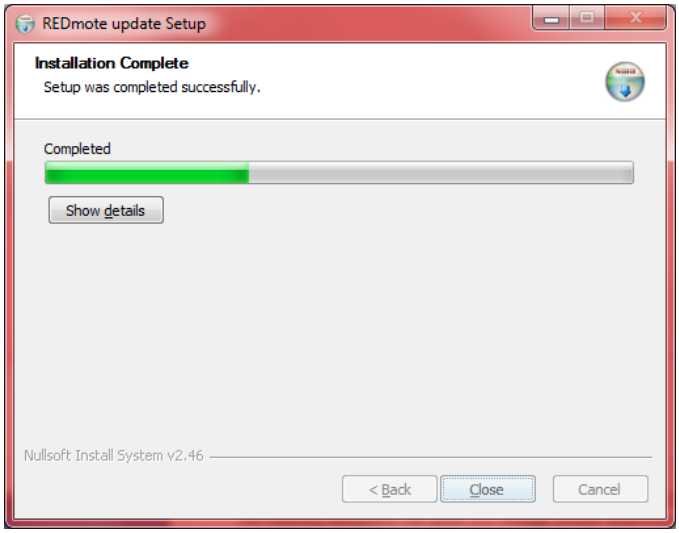
10. The program will now install. A progress bar is displayed while installing. When complete, select Close.



11. The REDMOTE Upgrade Utility installation is complete.

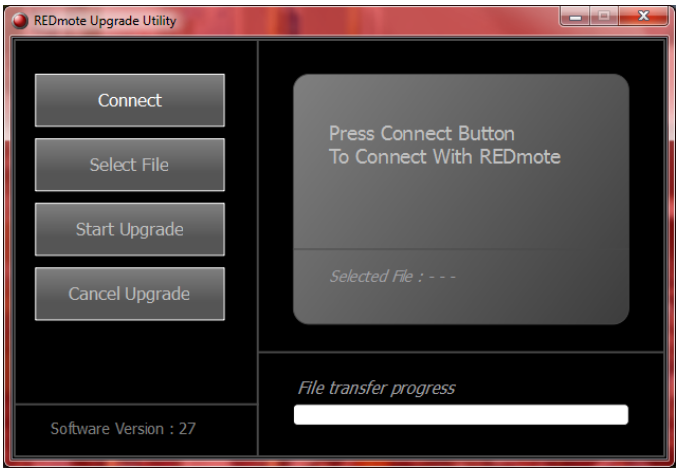
Upgrading REDMOTE Firmware

The following information will guide you through proper upgrading of your REDMOTE firmware on Windows computers using the REDMOTE Upgrade Utility.

1. Connect a USB to mini-USB cable between the computer and the USB connector on the REDMOTE.
2. Ensure the REDMOTE wakes up and displays the “Total Cameras Found” screen.

NOTE: When properly connected to the PC, the battery charge indicator will be Green and blink.

3. Under Programs, locate REDMOTE_update and open the program.
4. The REDMOTE Upgrade Utility window will open.



5. Select “Connect” to establish communication between the REDMOTE and REDMOTE Update.

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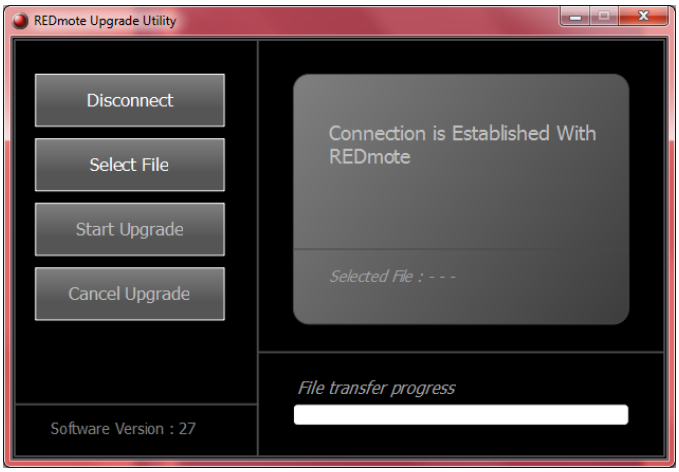
NOTE: If when connecting, communication is not established quickly, close the Upgrade Utility, open it again and select Connect again. This may have to be repeated a few times until communication is established.

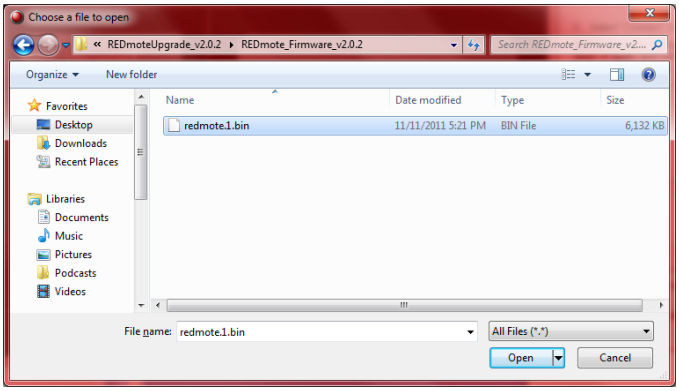
6. When connected, ”Connection is Established with REDMOTE” is displayed.



7. To begin upgrade, click on “Select File”.
8. Navigate to the *.bin file for updating the REDMOTE firmware.

NOTE: If you choose an incorrect file, click on “Select File” again to locate the correct file.

NOTE: Only one file can be added for upgrade.



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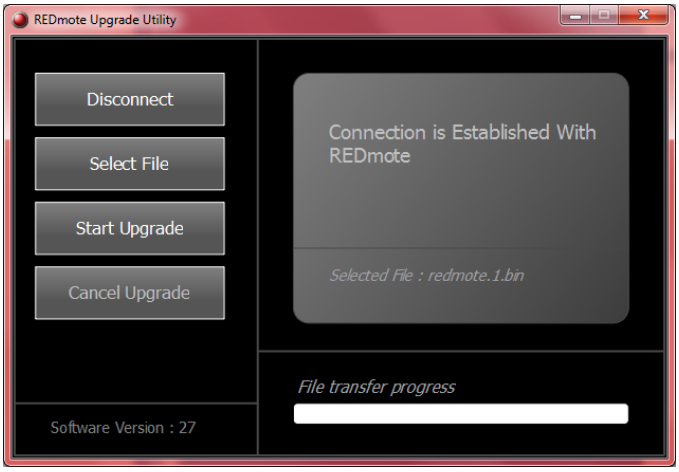
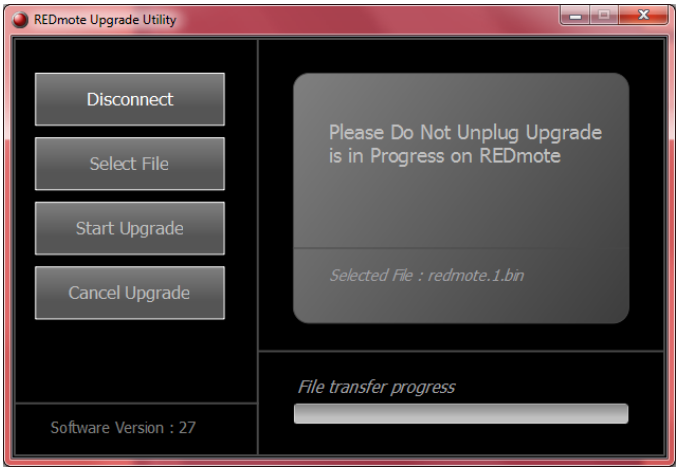
9. The selected file is shown in the window. In this case the selected file is: REDmote.1.bin.



10. After selecting and verifying the correct file for upgrading the REDMOTE, select “Start Upgrade”.
11. During the upgrade, the REDMOTE Software Wizard will display “Please Do Not Unplug” as well as a status bar showing “File transfer progress.”



12. During the upgrade, the REDMOTE will display “Upgrading Firmware” as well as a status bar showing upgrade progress.

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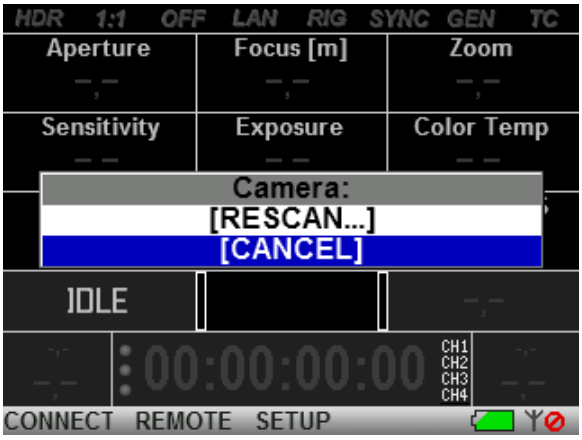
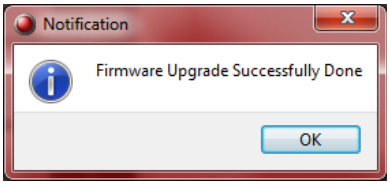
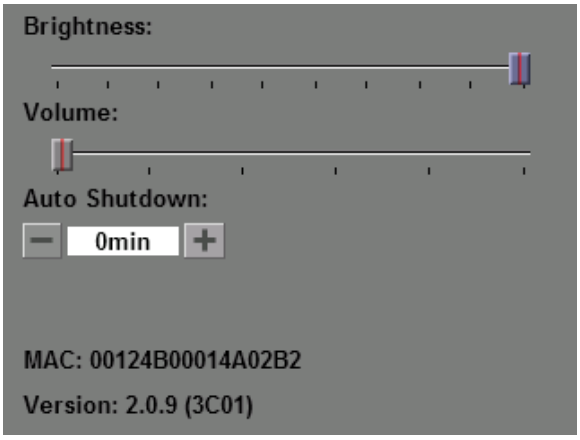
13. When upgrade is complete, the REDMOTE will automatically reboot and display “REBOOTING” on the screen.



14. The REDMOTE Software Wizard will display “Firmware Upgrade Successfully Done”.



15. Verify the current REDMOTE firmware version by selecting SETUP > SETUP SYSTEM on the REDMOTE.



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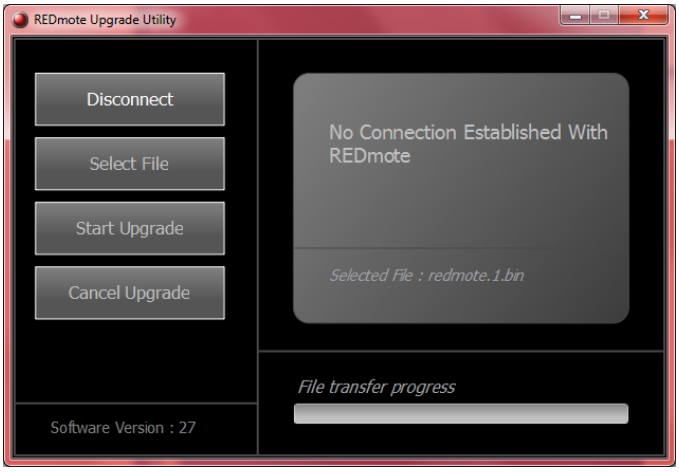
16. Select “Disconnect” on the REDMOTE Upgrade Utility.



17. REDMOTE firmware upgrade is complete.

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APPENDIX F: 3D SETUP / OPERATION

OVERVIEW

The following information outlines basic procedures to connect two RED DSMC cameras together in a Master / Slave configuration for 3D operation, operation of cameras in Master / Slave configuration and clip naming conventions for clips recorded on those cameras. The MASTER camera will control only the METADATA parameters of both cameras. On the SLAVE camera, any other setting outside of these will need to be manually changed before recording.

CAMERA SETUP

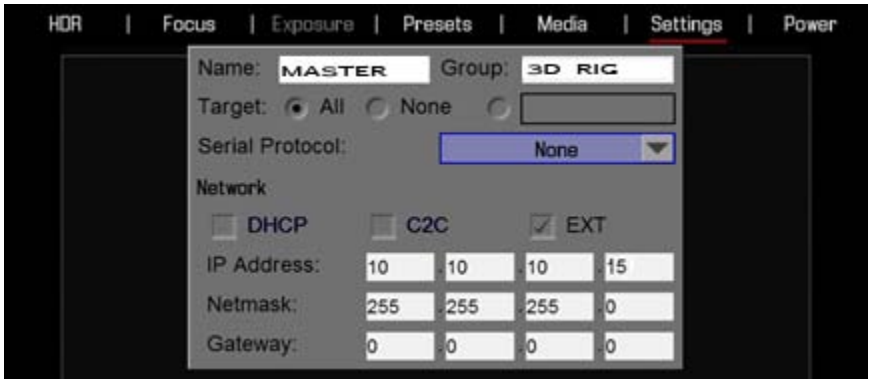
Select one camera to be designated as Master and a second to be designated as Slave.

NOTE: Cameras can also be set up in a MASTER / MASTER and SLAVE / SLAVE configuration. To set as MASTER / MASTER select ALL under TARGET for both cameras. This will allow either camera to make METADATA changes and control record start/stop of both cameras. To set as SLAVE / SLAVE select NONE under TARGET for both cameras. This allows each camera to control its own METADATA.

MASTER CAMERA

Perform the following steps on the Master camera:

1. Go to SECONDARY MENUS > SETTINGS > SETUP > COMMUNICATION > NAME and give the camera a unique NAME (CAM A, LEFT, etc…).


HDR | Focus | Exposure | Presets | Media | Settings | Power
Name: MASTER
Group: 3D RIG
Target: All None
Serial Protocol: None
Network
DHCP C2C EXT
IP Address: 10 10 10 15
Netmask: 255 255 255 0
Gateway: 0 0 0 0

2. Under TARGET select ALL.
3. Give the camera a unique IP address.
4. Go to SLAVE CAMERA.

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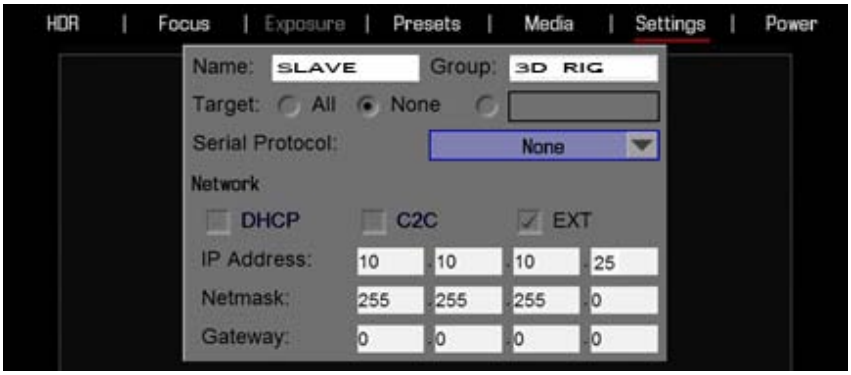
SLAVE CAMERA

Perform the following steps on the Slave camera:

1. Go to SECONDARY MENUS > SETTINGS > SETUP > COMMUNICATION > NAME and give the camera a unique NAME (CAM B, RIGHT, etc…).


HDR | Focus | Exposure | Presets | Media | Settings | Power
Name: SLAVE
Group: 3D RIG
Target: All None
Serial Protocol: None
Network
DHCP C2C EXT
IP Address: 10 10 10 25
Netmask: 255 255 255 0
Gateway: 0 0 0 0

2. Under TARGET select NONE.
3. Give the Slave camera a unique IP address different from the Master.

CLIP NAMING CONVENTIONS

REEL NO. / SLATE (CAMERA ID) / CAMERA POSITION

Before shooting in Master / Slave or Master / Master configuration for a Stereo / 3D production, make sure the Camera Slate (i.e. Reel No. and Cam ID) are set to the same value for both Master and Slave cameras. Then change the Cam Pos value from the system default of CENTER, to either LEFT or RIGHT to identify the "left eye" and "right eye" camera in the stereo pair.

The Reel No, Cam ID and Cam Pos can be set when formatting the media or after formatting by using the SET option. Refer to SECONDARY MENUS > MEDIA.

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For example, if Master is set to LEFT and Slave is set to RIGHT and both Cam IDs are set to S, the first clip recorded by this stereo camera configuration will be:

- **Master:** S001_L001_0503B6.R3D

- **Slave:** S001_R001_0503R7.R3D

Where 0503 represents 05 March, B6 and R7 are examples of camera generated wildcard characters.

Note: If both Master and Slave cameras are accidentally left in default settings of CENTER and CAM A ID, the clips recorded on each camera will have the same file structure, with the exception of the camera generated wildcard characters which protect against exact file name duplication:

- **Master: A001_C001_0503B6.R3D**

- **Slave: A001_C001_0503R7.R3D**

CONNECTING CAMERAS

1. While still powered up, interconnect the cameras using a Master/Slave GIG-E Cable P/N 790-0163. Plug the cable into the GIG-E connector on the rear of each camera body..

2. Power down both cameras, then power back up. If properly connected, LAN will illuminate Green on the UI.
3. Connect a SYNC cable P/N 790-0154 to each camera and connect as to your 3rd party device.
    - Yellow BNC connector is for SMPTE unbalanced Timecode input.

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- Green BNC connector is for Tri-Level Sync (Genlock) input.
- White BNC connector is a dual-purpose (Shutter SYNC input or GPI) input.

4. Go to SETTINGS > SETUP > GPIO/SYNC > SYNC MODE and select GENLOCK.
5. Verify the camera's project frame rate matches the Genlock and Timecode generator(s) framerate(s).
6. When properly connected and synchronized, TC, GEN and SYNC will illuminate Green on the UI.

OPERATION

CHANGING SETTINGS

When changes are made to the Master camera settings, the Slave camera setting will also change, but not in real-time. For example, when you change the Frame Rate on the Master camera, you will not see the change on the Slave camera until you set the Master camera at the new Frame Rate.

Also when making changes to the Secondary menu settings, the Slave camera will not display those changes unless it affects items displayed on the main screen (example: when HDRx is enabled on the Master camera, HDR will change to HDRx on the Slave camera).

RECORDING

When the power/record button is pressed on the Master camera to start/stop recording, the Slave camera will also start/stop recording.

POWER DOWN

When the Master camera is powered down using the Secondary Menu > Power, the Slave camera will also power down.

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APPENDIX G: EXPOSURE – USING FALSE COLOR AND ISO

NOTE: The following section uses a RED ONE camera display to illustrate exposure tools; however, the same principles apply to RED DSMC camera systems.

RED DSMC cameras provide several advanced exposure indication tools. In the following examples, we will show how these tools respond to a reference scene that is under-exposed, over-exposed and then correctly exposed. Each scene will have its unique characteristics so the "correct exposure" is a matter of judgment, balancing the desire to avoid clipping any highlights and also avoiding underexpose of elements in deep shadow – which may therefore be prone to noise when developed in post-production.

The following reference scene includes highlight and shadow elements and was shot at ISO 800.

UNDEREXPOSURE (~ 2 STOPS)

ISO 800 - Monitor Output

In the image above it is obvious the camera is under exposed. The initial clues are the monitor is very dark, and the histogram is justified to the left. Also note that red bar at the left edge of the histogram and the vertical color stack to the right of the histogram is only at grey. These indicators are saying a significant amount of the senor's RAW data is "in the noise" and that the peak level of the sensor's RAW data is at a very low level – in fact less than halfway.

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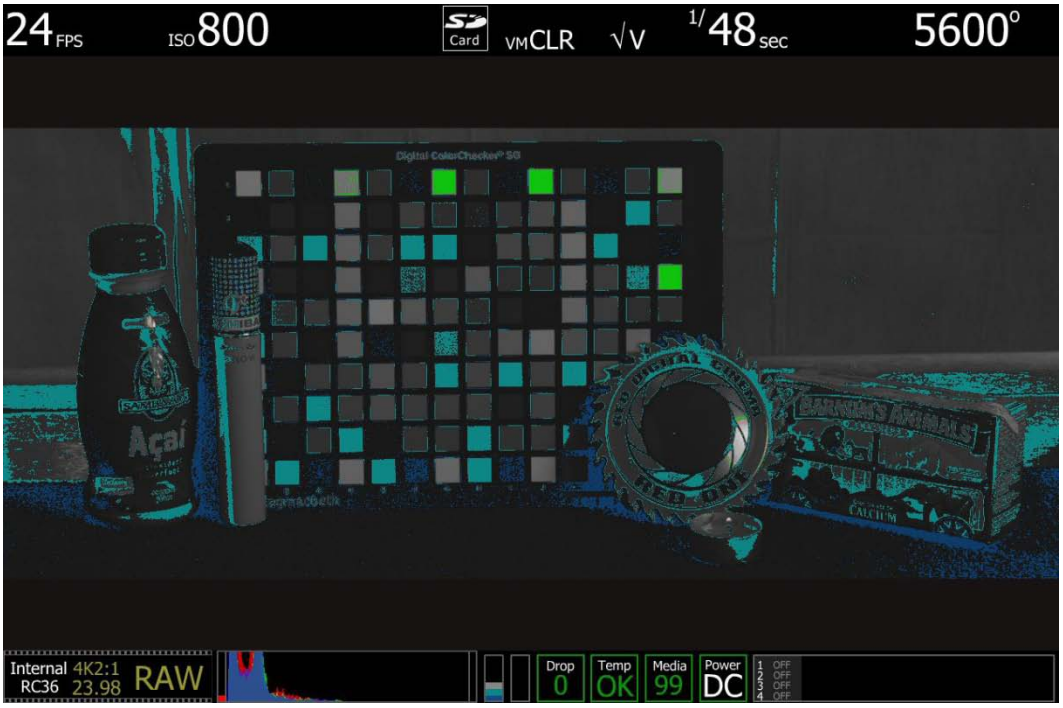
ISO 800 - False Color: Exposure

Select False Color – Exposure: note the√ E icon in the GUI when active. This mode allows us to visualize where in the image underexposure is taking place. These areas are indicated in purple. It is clear those areas are under the matchbox and coin, and between the bottle and cigar holder.



ISO 800 - False Color: Video

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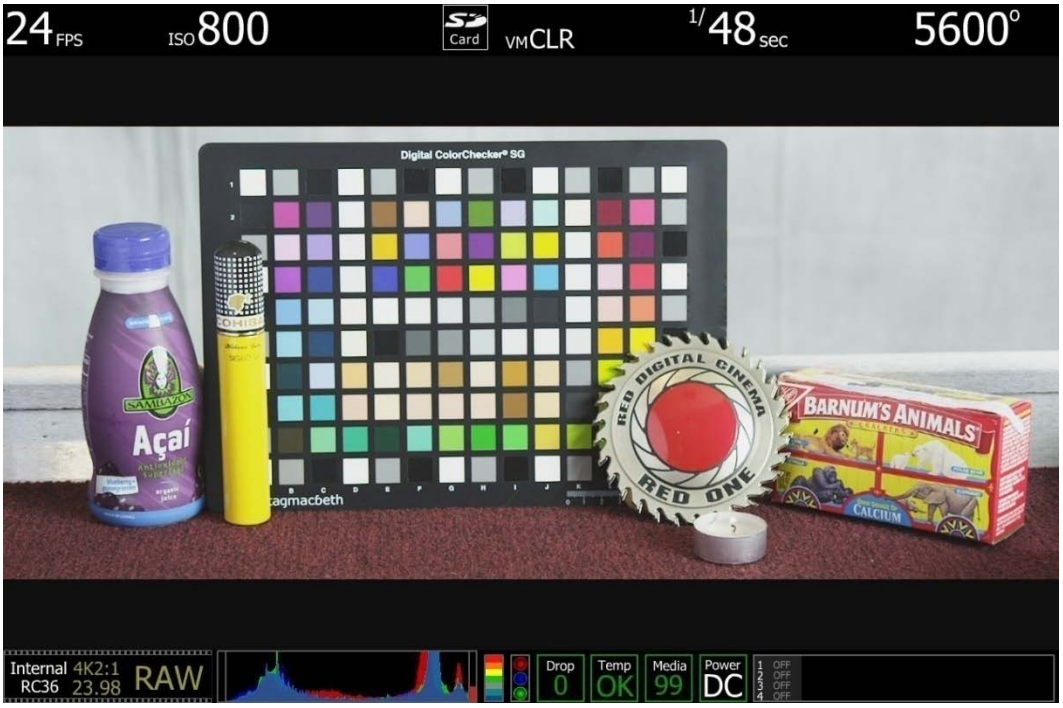
Select False Color – Video: note the √ V icon in the GUI when active. This mode allows us to check the RGB video levels of the scene. As the peak white chips on the test chart are showing up in green and the underexpose areas are showing up in dark blue, this says the monitor path video levels are only ranging between 44 IRE and 1 IRE.

Because the scene is under exposed, when the recorded .R3D file is color corrected in post-production, the scene's highlight information will certainly not be clipped, however the shadow information will probably display with significant noise once pushed to an acceptable brightness.

OVEREXPOSURE (~ 2 STOPS)



ISO 800 - Monitor Output

In the image above it is obvious the camera is over exposed. The monitor is very bright and the histogram is justified to the right. Note the red bar at the right edge of the histogram and the vertical color stack to the right of the histogram is showing red plus the three traffic lights to the right of that are all illuminated. These indicators are suggesting that a signification portion of the sensor's RAW data is "at clip", and this clipping is occurring on Red, Green and Blue channels.

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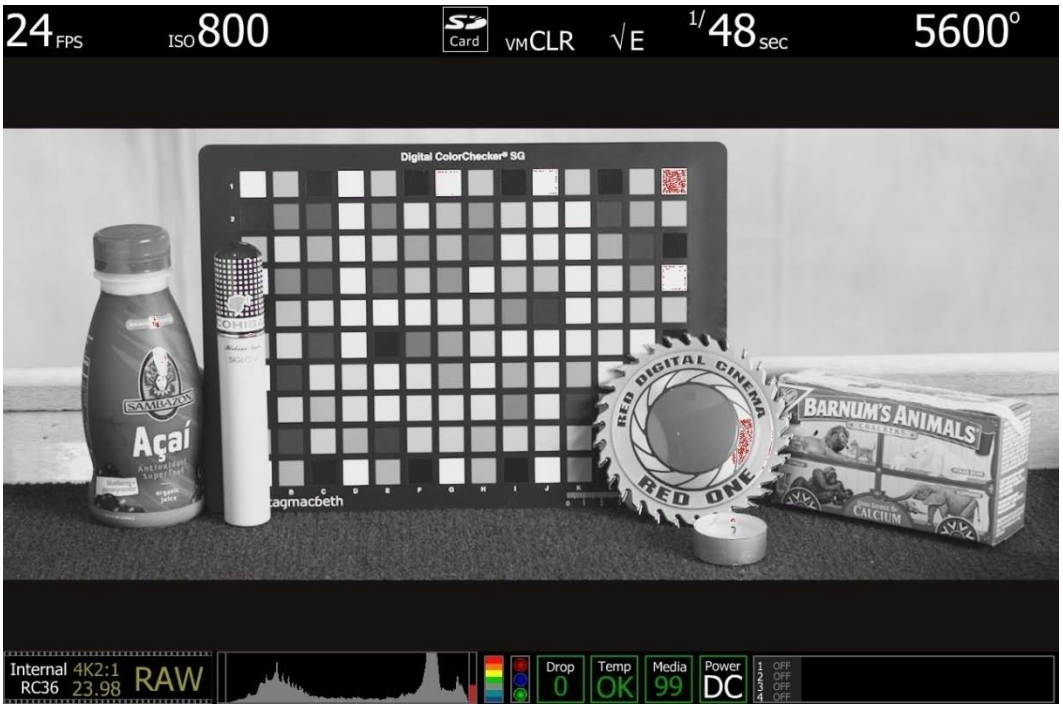

ISO 800 - False Color: Exposure

Select False Color – Exposure: note the√ E icon in the GUI when active. This mode allows us to visualize where in the image over exposure is taking place. These areas are indicated in red. It is clear those areas are on the highlight on coin, and at the top right edge of the color chip test chart.

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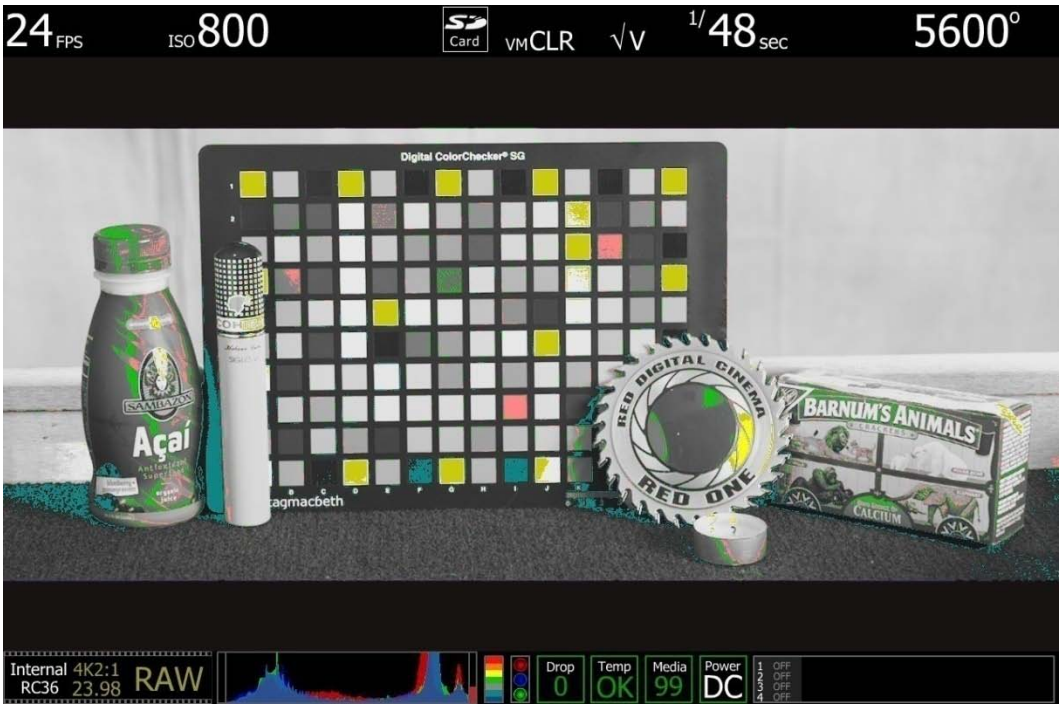

ISO 800 - False Color: Video

Select False Color – Video: note the √ V icon in the GUI when active. This mode allows us to check the RGB video levels of the scene. As all the white chips on the test chart are Yellow, this suggests that a significant portion of the monitor path video is at the maximum legal 100 IRE value.

Because the scene is over exposed, when the recorded .R3D file is color corrected in post-production, the scene's highlight information will almost certainly be clipped, however the shadow information will probably display cleanly once pulled back down to an acceptable brightness.

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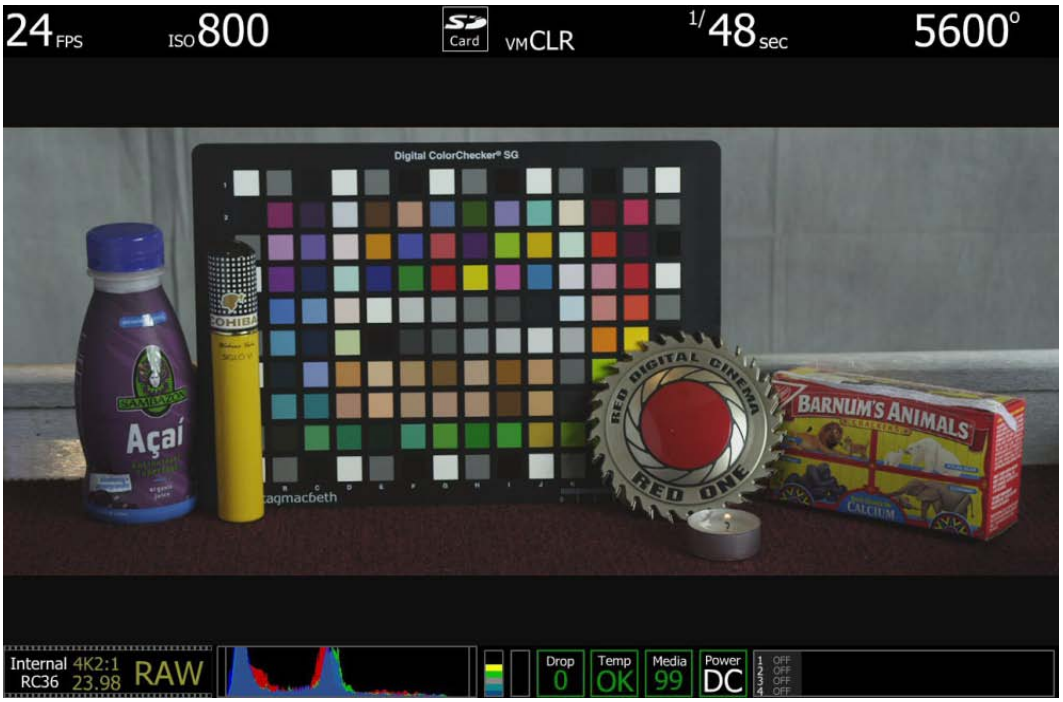
APPROPRIATE EXPOSURE



ISO 800 - Monitor Output

In this image, the camera is appropriately exposed for this scene. The monitor is neither very dark nor very bright and the histogram is spread evenly given that there are bright highlights on the coin we wish not to blow out. Note that there is no red bar on either the left or the right edges of the histogram and the vertical color stack to the right of the histogram is at yellow. These indicators suggest that there is no significant amount of the sensor's RAW data "in the noise" or "at clip", and that the peak level of the sensor's RAW data is about 2/3 stop below clipping.

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ISO 800 - False Color: Exposure

Select False Color – Exposure: note the√ E icon in the GUI when active. This mode allows us to visualize where there is under exposure (purple) or over exposure (red) in the image. In this case, there is a very small area of purple under the cracker box, and just a suggestion of red on the highlight on the coin, which suggested that the sensor is appropriately exposed for this scene.

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ISO 800 - False Color: Video

Select False Color – Video: note the √ V icon in the GUI when active. This mode allows us to check the RGB video levels of the scene. The two green squares in the upper right corner of the color chart and green in the background indicate that the scene's mid grey and skin tone elements, plus peak white and blacks are all at appropriate levels.

Because the scene was well exposed, when the recorded clip is color corrected in post-production, sufficient headroom exists for the scene's highlight information to be displayed without clipping, and the shadow information can be displayed without significant noise, even if the brightness of the shadow information is pulled up.

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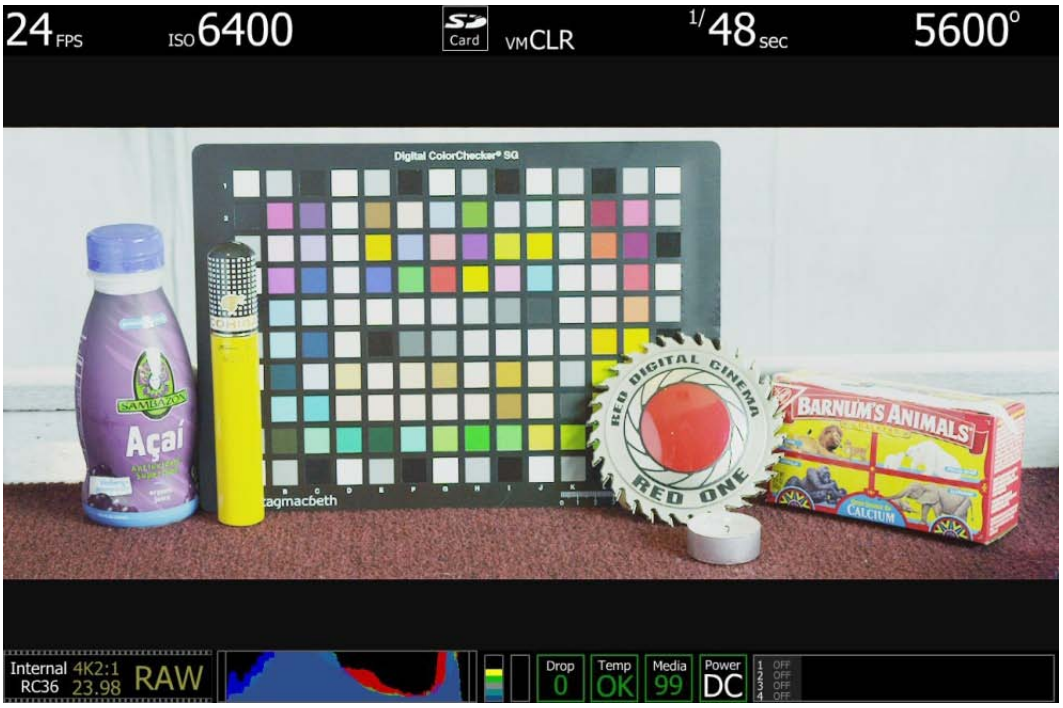
ADJUSTING THE ISO RATING

In the following two examples, the image exposed at ISO 800 rating have had the ISO rating adjusted first to ISO 6400 and then to ISO 100.

NOTE: Although the image and Histogram both adjust to changes in the ISO rating, the sensor RAW meters do not change – they always indicate what is happening at the sensor level and hence where the image is truly in noise or at clipping.



ISO 6400 - No Exposure Adjustment

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ISO 100 - No Exposure Adjustment

In these extreme examples, it is clear that the RGB domain images are respectively very bright and very dark. The histogram data reflects that, however you can also see that the sensor RAW meters are unchanged. The exposure at the sensor at this point in time is the same. If you choose to close the iris to reduce the brightness of the first image you will be reducing exposure at the sensor – this biases exposure in favor of protecting the scene highlight. Alternatively, if you choose to open the iris to increase the brightness of the image of the second image you will be increasing exposure at the sensor – this biases exposure in favor of minimizing noise in the scene shadows.

The technique is similar in principle to re-rating a film stock. With practice, the ISO rating can be used as a tool to assist ideal exposure based on the dynamic range identified within the scene.

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APPENDIX H: POST-PRODUCTION

RED workflow is quite easy to understand, especially if you have experience with photographic RAW image processing, or shoot 16mm or 35mm film followed by a telecine transfer to video for non-linear video editing and on-line conform.

The RAW data captured by RED cameras has wide dynamic range and color space, so you can freely change the white balance, adjust exposure and alter highlight and shadow tonality in post-production.

The RED DSMC camera records RAW sensor data using wavelet based REDCODE RAW compression to REDMAG 1.8" SSD. The compressed RAW data is then transferred from the digital media to a Macintosh OSX or Windows XP workstation running REDCINE-X PRO post-production software. These applications do not directly edit or conform the RAW data themselves, but prepare the RAW data for editing and conforming by RGB domain post-production software applications.

In film processing terms, REDCINE-X PRO act as an integrated film laboratory, telecine, and one light color corrector. It converts recorded REDCODE RAW data to RGB video, and provides basic one light image processing and color correction. Using REDCINE-X PRO, footage can also be cropped, resized, or repositioned.

REDCINE-X PRO can also encode 4K or 2K RAW footage into a variety of uncompressed RGB and compressed 4:2:2 video formats. For film out, multi-media or special effects applications, REDCINE-X PRO may export a sequence of 2K or 4K image files in TIFF, Open EXR, DPX, JPEG, or Photoshop PSD file formats.

Provided the appropriate QuickTime codecs are available on the host computer workstation, compressed video choices include ProRes, DNxHD, DV100 and M-JPEG QuickTime movies at 1080p or 720p resolution, providing compatibility with the majority of non-linear editing systems.

Depending on the QuickTime movie resolution, material may be taken directly to a broadcast delivery videotape format, or after the editorial decisions have been made, video can be conformed at full image resolution by replacing the lower resolution edit proxy with a high resolution 4K, 2K or 1080p image file.

MONITORING

When using RED Digital Cinema software tools it is recommended your monitor should be set to Adobe 1998, or to SMPTE-C display profile. If you use the HD Cinema display profile, adjust the gamma to 2.2.

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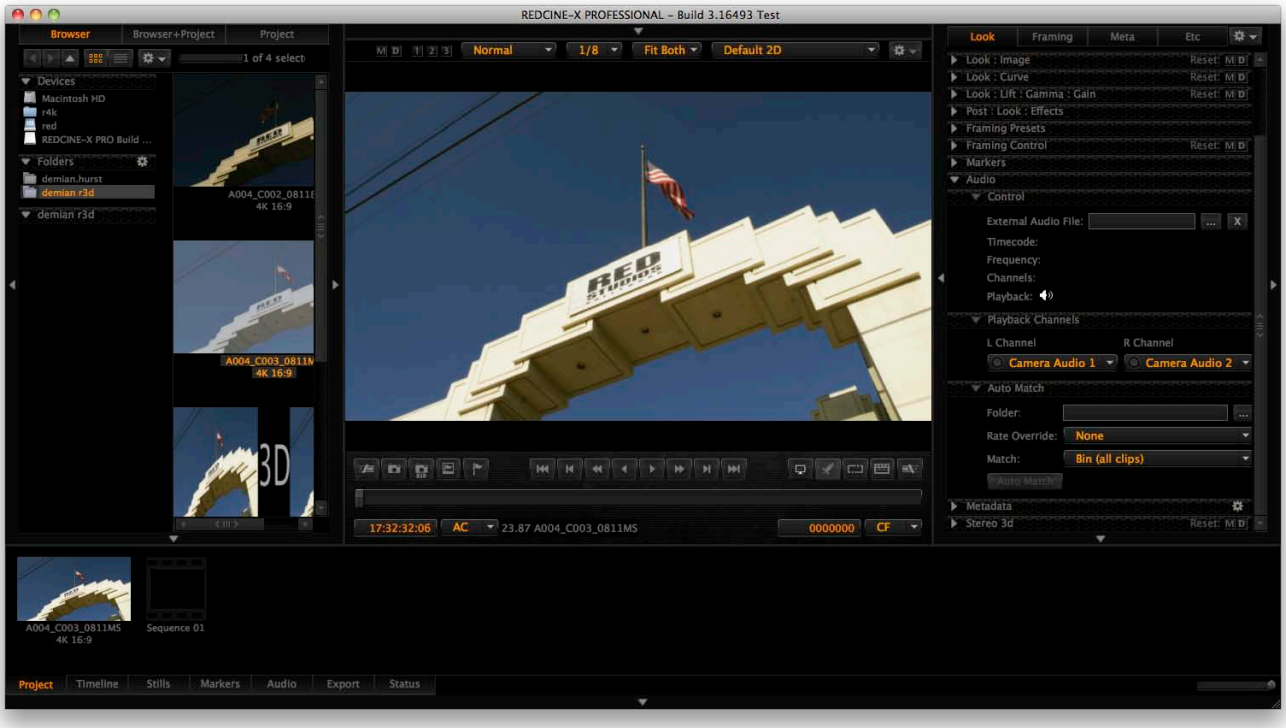
REDCINE-X® PRO

REDCINE-X PRO is available for Intel based Mac OSX and Windows XP platforms. The application performing white balance and one light color correction, image pan/scan, crop and scaling operations.

The application can export either a single clip, or a sequence of clips, as 4K or 2K resolution 10-bit DPX or 16-bit TIFF files. REDCINE-X PRO can also render clips into standalone QuickTime movies using a variety of video codecs including H.264, Apple ProRes and Avid DNxHD



REDCINE-X PRO is available for download at **http://www.RED.com/support**. The REDCINE-X PRO Operation Guide Is included with the download package.

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APPENDIX I: MAINTENANCE

WARNING: DO NOT attempt to modify, dismantle or open your camera, lens or other accessory as doing so may expose you to electric shock and serious injury. There are no user-serviceable parts inside. Alteration or repairs made to the camera, lens or other accessory, except by a RED authorized service facility, will void the Limited Warranty.

CLEANING

All RED products are designed for rugged durability, but precision instruments demand proper care. Please note the following care guidelines:

WARNING: DO NOT rinse or immerse any element of the camera, lens or other accessory, keep them dry at all times.

WARNING: DO NOT use soaps, detergents, ammonia, acetone, alkaline cleaners, abrasive cleaning compounds, or solvents. These substances may damage lens coatings and electronic circuitry.

CAMERA AND ACCESSORY EXTERIOR SURFACES

Clean ONLY using a dry cloth. When cleaning your camera and accessories, remember that it is not waterproof and moisture can damage electronic circuitry.

BRAIN

OPTICAL LOW-PASS FILTER (OLPF)

If equipped with an OLPF, use Delkin Devices Digital Duster Kit (P/N DDSS-DUSTER2) or equivalent to clean OLPF surface.

LCD SCREEN (TOUCHSCREEN / NON-TOUCHSCREEN)

The specialized AR and AS coatings on RED TOUCH LCD displays must be treated with special care to avoid scratching. To help maintain the specialized AR and AS coatings on RED TOUCH LCD displays, the RED TOUCH LCD comes with a RED Microfiber bag for cleaning and storage. Using it will preserve the superior quality of these coatings. Hand wash and air-dry the RED Microfiber bag regularly.

NOTE: RED's warranty does not cover any LCD display against scratches or damage due to use of improper chemicals to clean the LCD.

ONLY USE a RED Microfiber bag or equivalent Photographic Solutions PEC*PADs (P/N 05011) and Isopropyl Alcohol (>95%) or equivalent Pancro Professional Lens Cleaner (P/N PANCROCLN) to clean the screen on Touchscreen and Non-Touchscreen LCDs.

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DO NOT USE any other solvents, chemicals or third party cleaning kits because they have not been tested on RED TOUCH LCD displays and can possibly damage them. Not approved for use on RED TOUCH LCD displays:

- Rubbing Alcohol
- Isopropyl Alcohol (<90%)
- Windex
- Pre-packaged lens cleaner containing any additives, such as detergent, anti-static, fragrance, etc.

For proper cleaning and storage, remember to protect the RED TOUCH LCD by storing it in the RED Microfiber bag.

EVF

Use Pancro Professional Lens Cleaner (P/N PANCROCLN) and Photographic Solutions PEC*PADs (P/N 05011) or equivalent to clean the viewfinder lens. Ensure your spray the solution onto the pad and not directly onto the lens surface.

REDMOTE SCREEN

Use Pancro Professional Lens Cleaner (P/N PANCROCLN) and Photographic Solutions PEC*PADs (P/N 05011) or equivalent to clean the screen on Touchscreen and Non-Touchscreen LCDs.

LENSES

Use Pancro Professional Lens Cleaner (P/N PANCROCLN) and Photographic Solutions PEC*PADs (P/N 05011) or equivalent to clean the viewfinder lens. Ensure your spray the solution onto the pad and not directly onto the lens surface.

SIDE HANDLE LCD

Use Pancro Professional Lens Cleaner (P/N PANCROCLN) and Photographic Solutions PEC*PADs (P/N 05011) or equivalent to clean the screen on the Side Handle LCD.

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BACK FOCUS ADJUSTMENT

WARNING: THERE IS A SCREW-IN METAL PLUG INSTALLED IN THE CAMERA BODY COVERING THE BACK FOCUS SCREW. THIS PLUG MUST BE REMOVED BEFORE PERFORMING A BACK FOCUS ADJUSTMENT. TO REMOVE THE PLUG, USE A T-10 TORX SCREWDRIVER.

NOTE: To perform this procedure as written, you must have a PL mount and RED Focus™.

Back focus is adjusted by turning the back focus adjustment on the top of the camera's front plate using a T-10 Torx screwdriver. This screw is indicated by a Siemens Star with an arrow pointing to its location.

Back Focus Adjustment Location

1. Remove the screw-in plug located in the back focus adjustment opening using a T-10 Torx screwdriver.
2. Place the camera on a level, stable surface or mount the camera on a tripod.
3. Install RED Focus to the camera PL mount.
   a. Remove the camera lens or sensor cover if equipped.
   b. Install RED Focus onto the camera in the position shown.
   c. Ensure RED Focus is secured to the camera with the camera lock ring.

RED Focus Properly Installed on Camera

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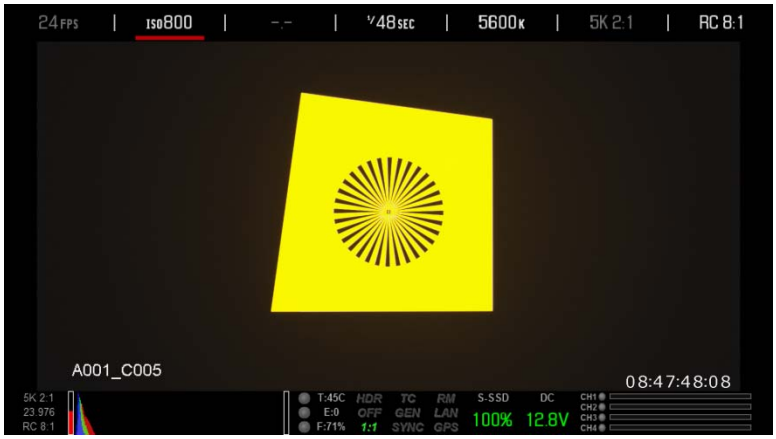
4. Power up the camera.
5. Power up RED Focus. Refer to POWER UP / DOWN.

   NOTE: Remember that RED Focus will AUTOMATICALLY power down after 3 minutes. Press the Red button on the front to power back up.

6. Set the camera to Magnify. Go to SECONDARY MENUS > SETTINGS > DISPLAY > FALSE COLOR > MAGNIFY.

   NOTE: The "Focus" option located under SECONDARY MENUS > SETTINGS > DISPLAY > FALSE COLOR > FOCUS can serve as a good double-check for proper focus during this procedure.



RED Focus Displayed Image on Camera

7. Insert a T-10 Torx screwdriver into the back focus adjustment screw. The screw is oriented at approximately 80° as shown.

Performing Back Focus Adjustment

8. Carefully and slowly, rotate the back focus adjustment screw to achieve optimum focus.
   - Turning CLOCKWISE moves the sensor forward.
   - Turning COUNTER-CLOCKWISE moves the sensor rearward.

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NOTE: The center of the image will never be in perfect focus as the lines are less than 1/3 of a pixel in size.

9. The back focus adjustment mechanism is self-locking, and does not require a supplementary locking screw.
10. Install the screw-in plug in the back focus adjustment opening using a T-10 Torx screwdriver.
11. This completes the back focus adjustment.

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APPENDIX J: TROUBLESHOOTING

NO MEDIA ATTACHED

Displayed if media is not present or not formatted when pressing the record button. Connect media to camera if necessary. If media is already connected, format media and attempt to record again. Refer to APPENDIX B: MANAGING DIGITAL MEDIA for detailed information.

RECORDING HALTED: RECORD ERROR - SHUTDOWN

Displayed if media removed while recording. DO NOT remove media while camera is recording. Power down the camera, verify the media is inserted properly (inspect connectors for damage), power up and resume recording.

PRESET COULD NOT BE APPLIED

If the preset could not be applied, “Preset Could Not Be Applied” will appear to inform you. Power down camera, power back up and attempt to apply the preset that failed.

CAMERA CANNOT BE PAIRED TO REDMOTE

- Ensure REDMOTE display indicates IDLE before attempting to pair the camera to the REDMOTE.
- Ensure the REDMOTE is detached from the rear of the camera body and powered on.
- Ensure the REDMOTE wireless in turned on.
- Ensure camera does not display REDLINK Upgrade Required.

CANNOT SEE MENUS ON LCD TOUCH SCREEN

Double tap the LCD screen to exit *clean mode*.

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APPENDIX K: TECHNICAL SPECIFICATIONS

SENSOR	14 MEGAPIXEL MYSTERIUM-X™
PIXEL ARRAY	5120 (h) x 2700 (v)
S/N RATIO	66db
DYNAMIC RANGE	13.5 stops, up to 18 stops with HDRx™
MAX IMAGE AREA	5120 (h) x 2700 (v)
LENS COVERAGE	27.7mm (h) x 14.6mm (v) x 31.4 mm (d)
DEPTH OF FIELD	Equivalent to S35mm (Motion) / APS-H (Still) lenses Equivalent to 16mm (Motion) lens in 2K RAW
ACQUISITION FORMATS	5K RAW (Full Frame, 2:1, 2.4:1 and Anamorphic 2:1) 4.5K RAW (2.4:1) 4K RAW (16:9, HD, 2:1 and Anamorphic 2:1) 3K RAW (16:9, 2:1 and Anamorphic 2:1) 2K RAW (16:9, 2:1 and Anamorphic 2:1) 1080p RGB (16:9) 720p RGB (16:9)
PROJECT FRAME RATES	23.98, 24, 25, 29.97, 47.96, 48, 50, 59.94 fps, all resolutions
DELIVERY FORMATS*	4K : DPX, TIFF, OpenEXR (RED RAY via optional encoder) 2K : DPX, TIFF, OpenEXR (RED RAY via optional encoder) 1080p RGB or 4:2:2, 720p 4:2:2 : Quicktime, JPEG Avid AAF, MXF. 1080p 4.2.0, 720p 4:2:0 : H.264, .MP4
PROGRAM OUTPUT	HD-SDI Clean Feed 2K RGB, 1080p RGB or 4:2:2, 720p 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
MONITOR OUTPUT	HD-SDI and HDMI with Frame Guides and Look Around 2K RGB, 1080p RGB or 4:2:2, 720p RGB or 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
DIGITAL MEDIA	REDMAG (SSD) Module : (64, 128, 256GB Media)
REDCODE™ **AUDIO**	12 and 16-bit RAW : Compression choices of 18:1 to 3:1 1-120 fps 5K, 4.5K; 1-150 fps 4K; 1-200 fps 3K; 1-300 fps 2K 2 channel, uncompressed, 24 bit, 48KHz. Optional 4 channel, and AES / EBU digital audio.
MONITORING OPTIONS	RED LCD 5" Touchscreen Display BOMB EVF™ High Definition Viewfinder
REMOTE CONTROL	Wireless, Ethernet, RS232, GPI Trigger
WEIGHT	5lbs. Body only
CONSTRUCTION	Aluminum Alloy
TEMPERATURE RANGES	Operating Range: 0˚C to +40˚C (32˚F to 104˚F) Storage Range: -20˚C to +50˚C (-4˚F to 122˚F)

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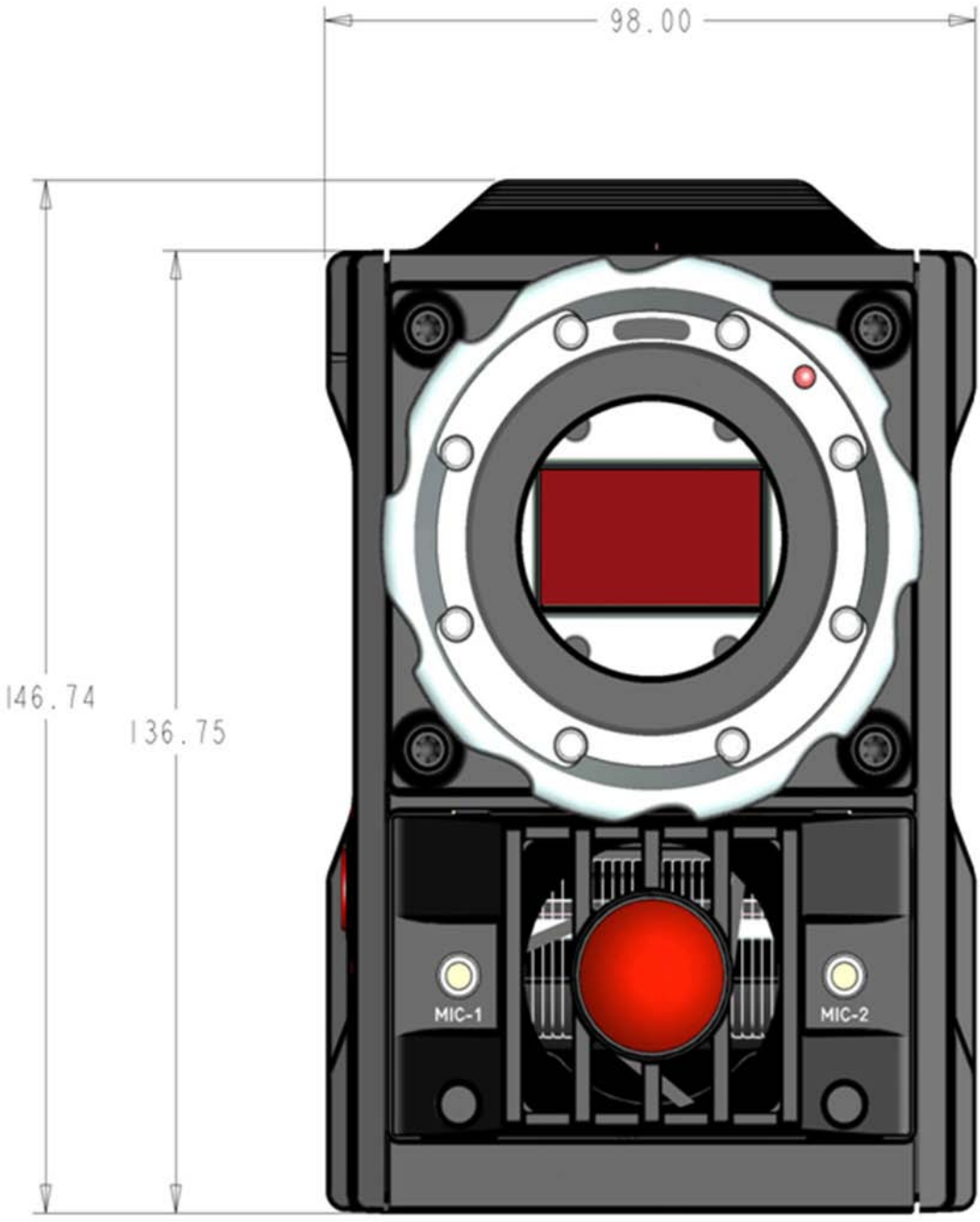
CAMERA BRAIN DIMENSIONS



Front View

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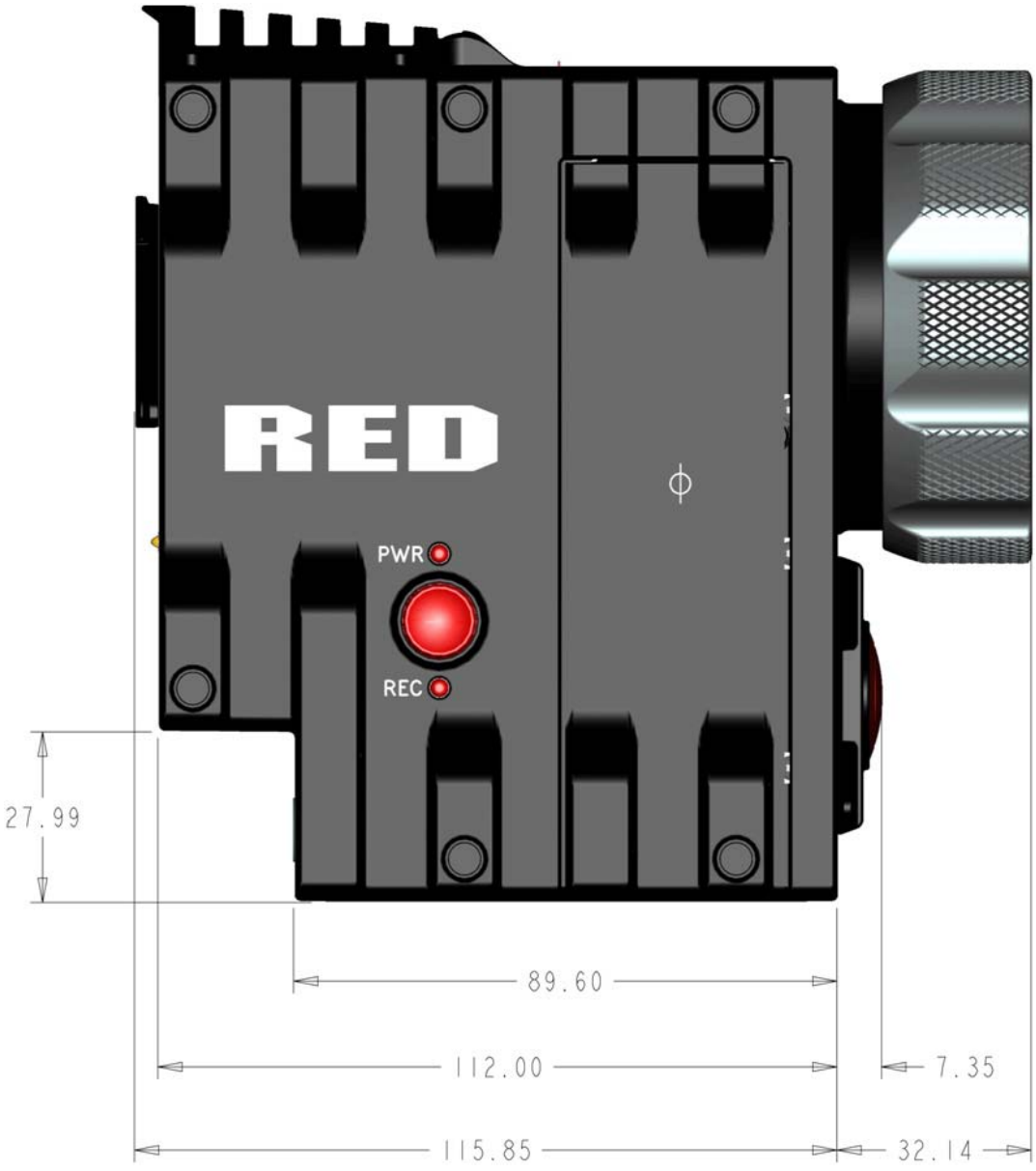

Side View

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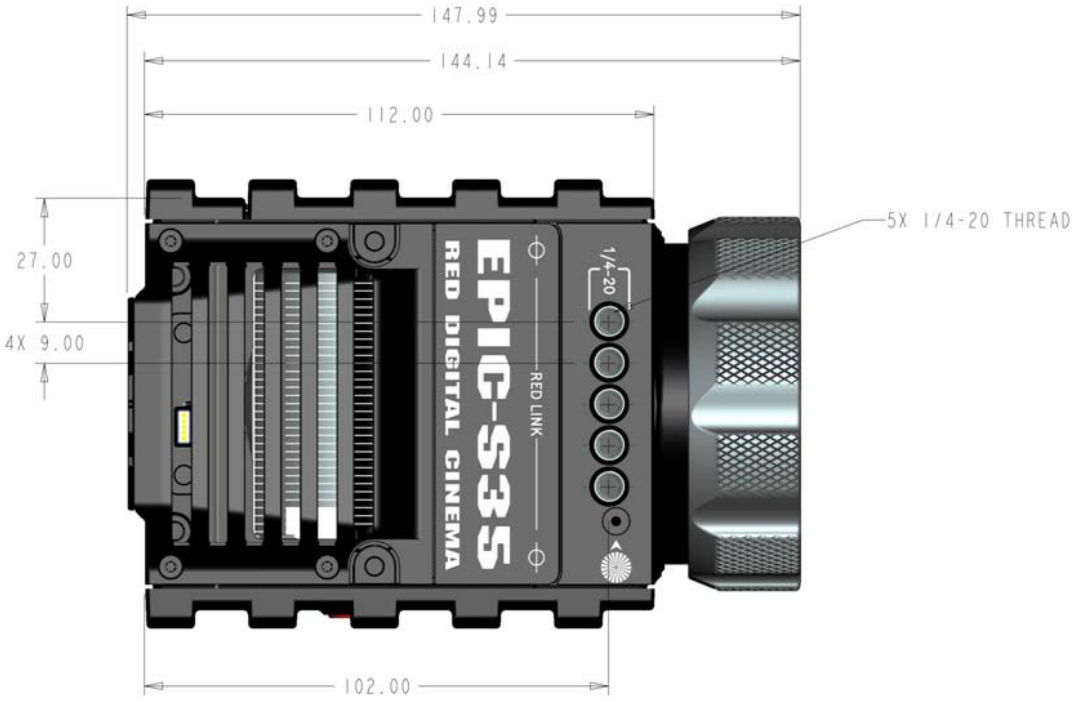
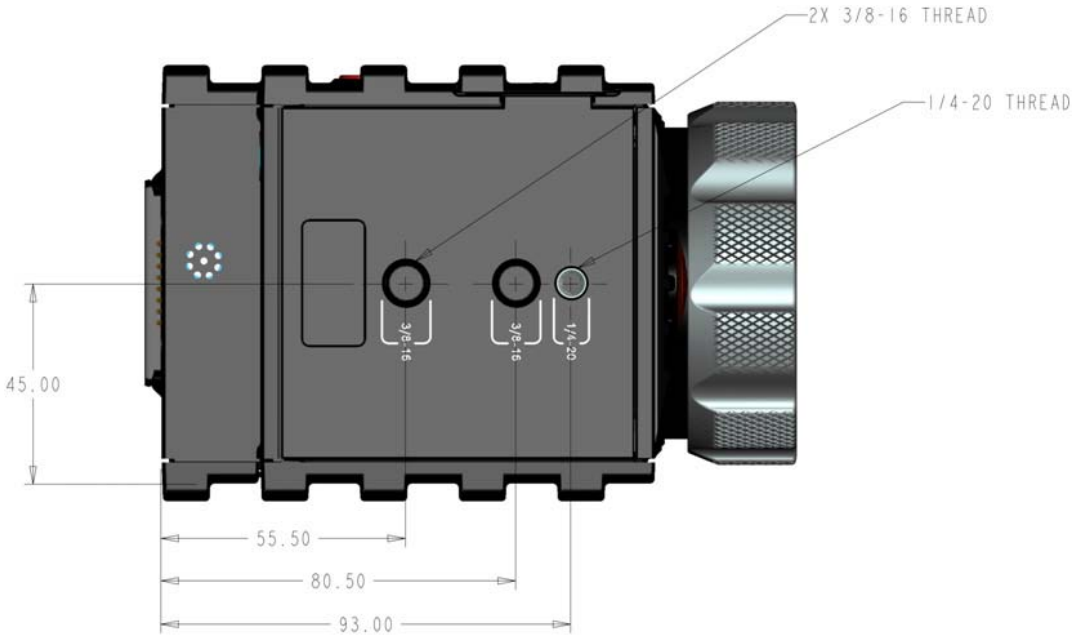


Top View



Bottom View

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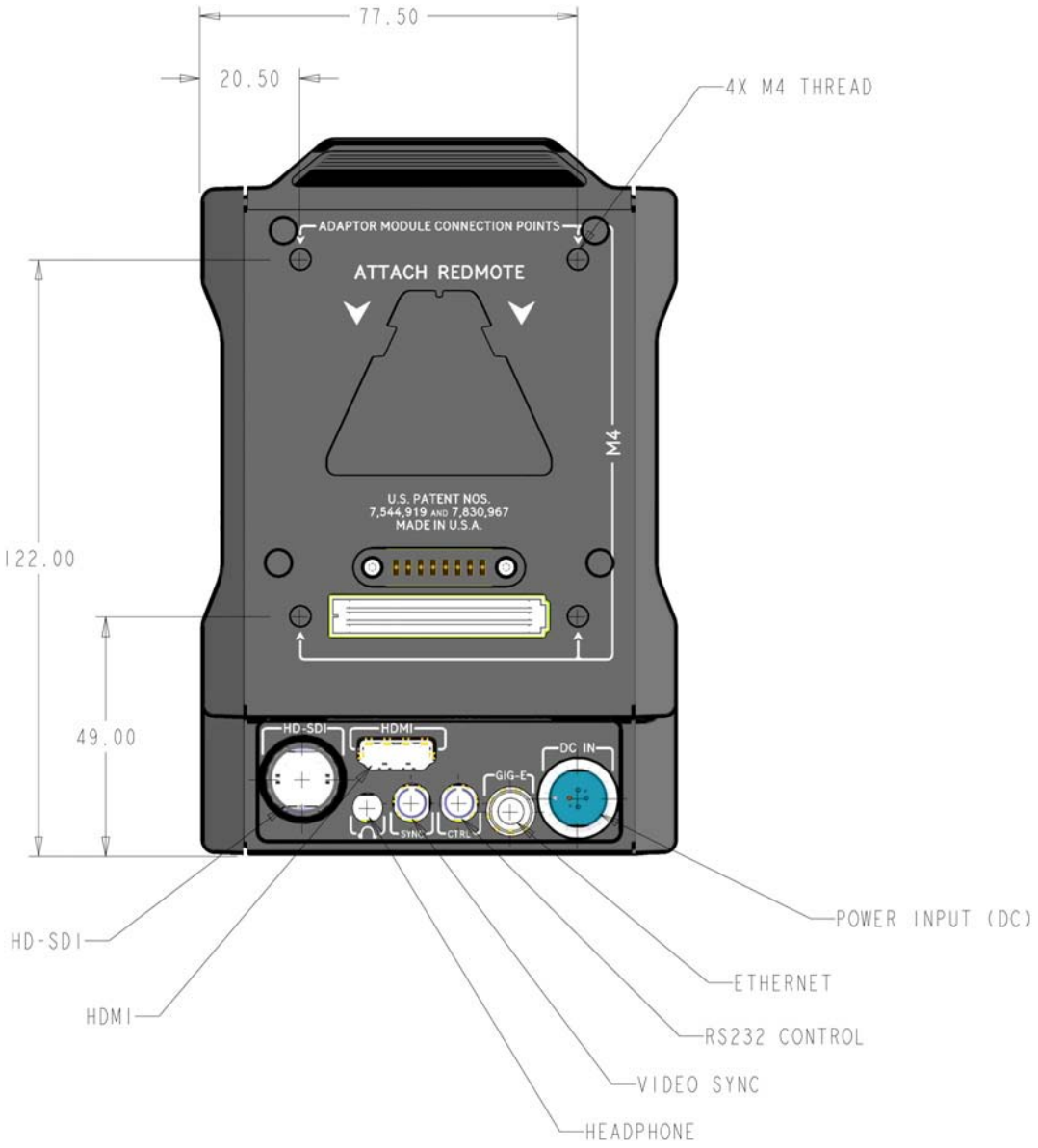

Back View

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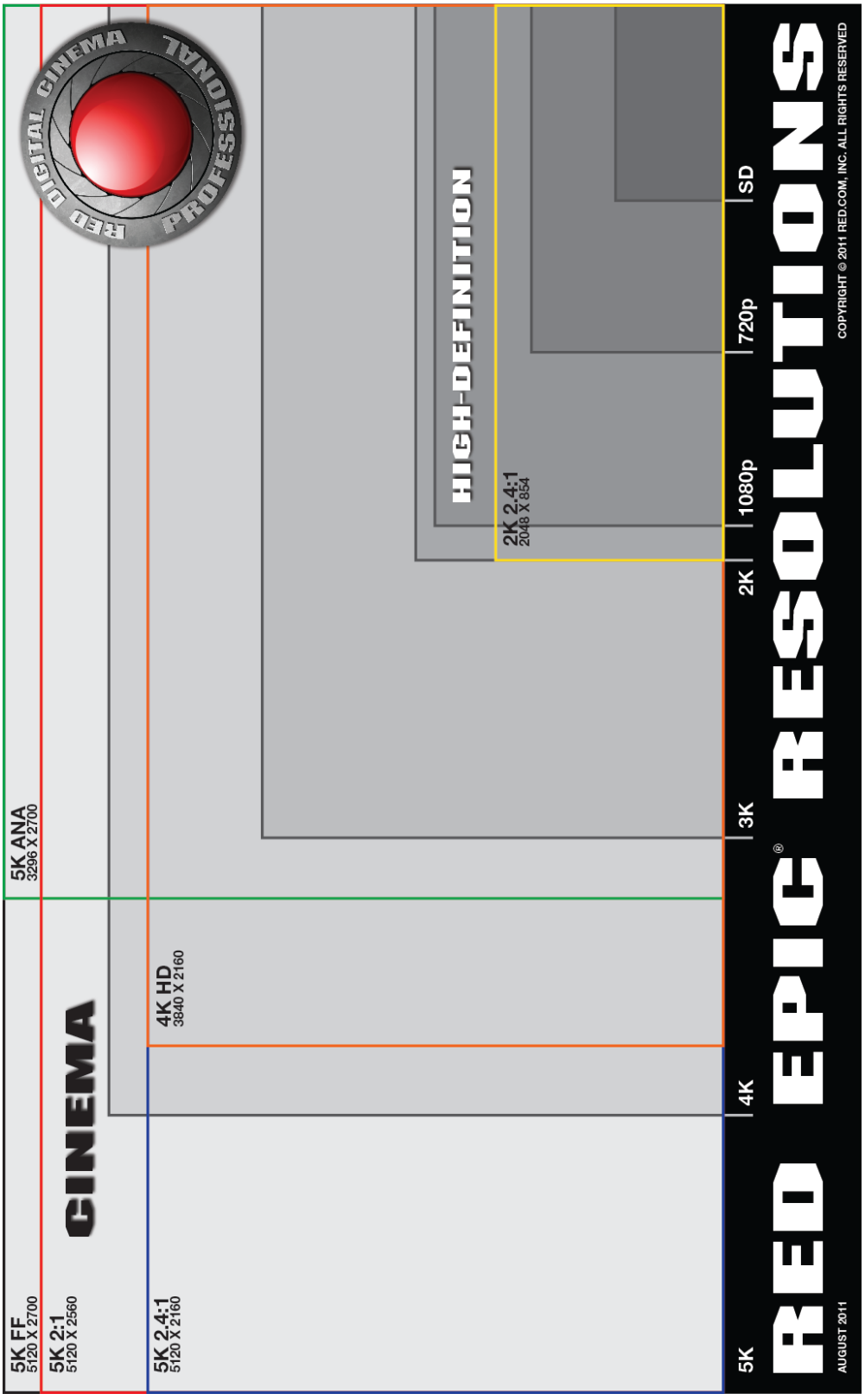
APPENDIX L: RESOLUTION CHART



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APPENDIX M: MENU MAPS

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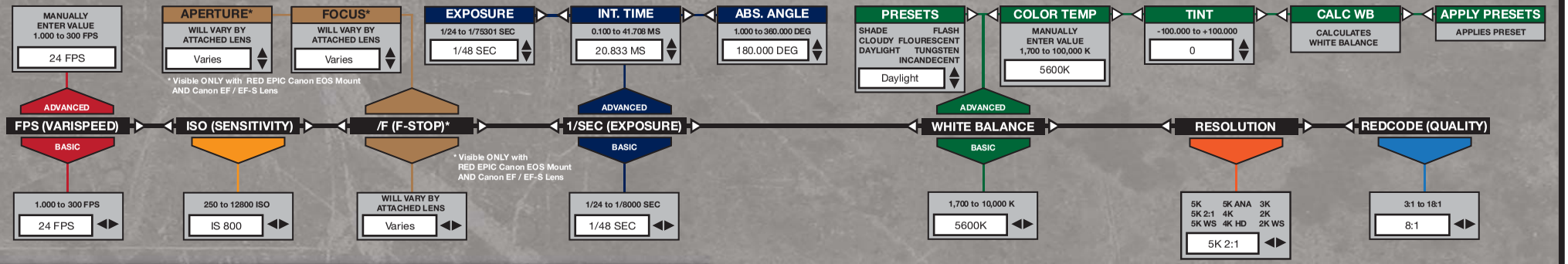
MAIN MENU

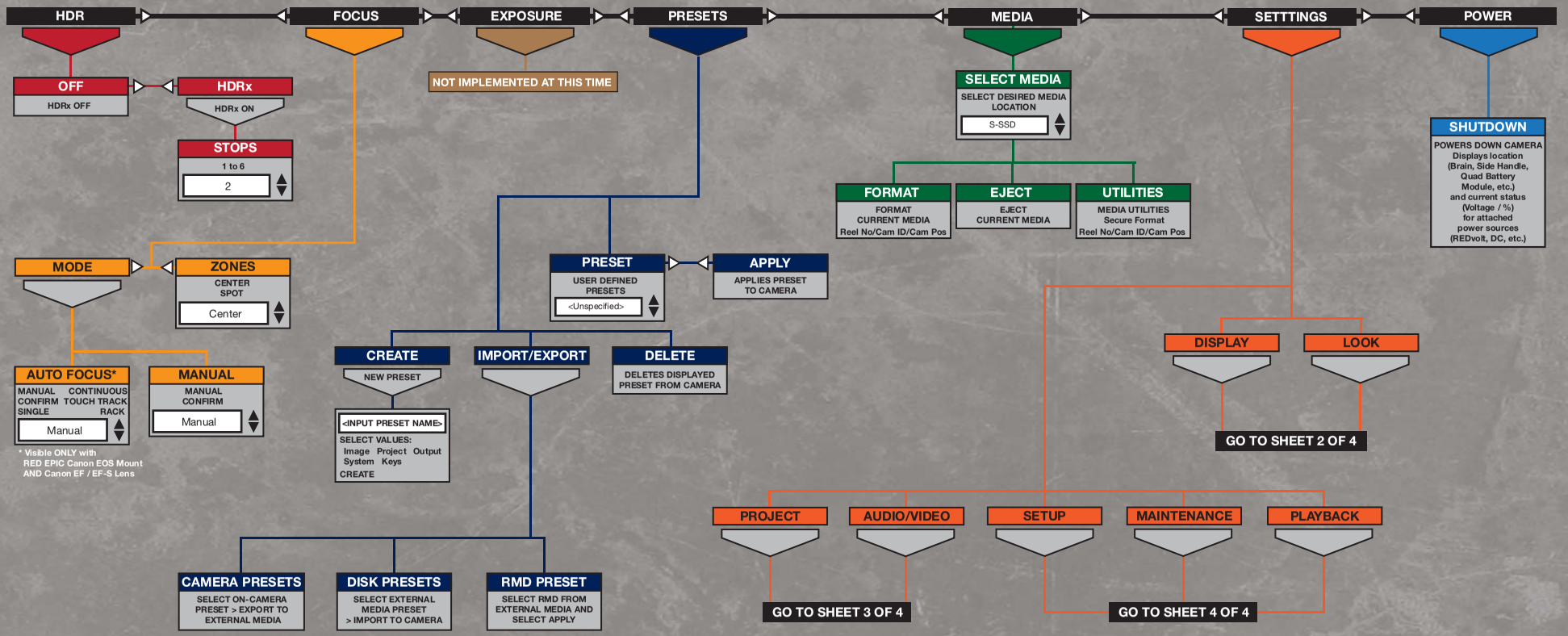
FLOWCHART CONCEPT XL FILMS LTD.

DEFAULT VALUES ARE DISPLAYED IN BOXES



SECONDARY MENUS

PRESS MENU ICON (LCD) OR MENU BUTTON TO ACCESS



RED EPIC®
EPIC-M & EPIC-X

TITLE: MENU MAP

VERSION: 3.2

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SHEET 1 OF 4

REV A

SECONDARY MENUS

PRESS MENU ICON ▤ (LCD) OR MENU BUTTON TO ACCESS

FLOWCHART CONCEPT XL FILMS LTD.

DEFAULT VALUES ARE DISPLAYED IN BOXES

HDR | FOCUS | EXPOSURE | PRESETS | MEDIA | SETTTINGS | POWER

GO TO SHEET 1 OF 4

GO TO SHEET 1 OF 4

DISPLAY | LOOK | PROJECT | AUDIO/VIDEO | SETUP | MAINTENANCE | PLAYBACK

GO TO SHEET 3 OF 4

GO TO SHEET 4 OF 4

COLOR | GAIN | FLUT® | COLOR/GAMMA

RED 0.0 TO 10.0 [1.000] ◀▶
GREEN 0.0 TO 10.0 [1.000] ◀▶
BLUE 0.0 TO 10.0 [1.000] ◀▶

SPACE / GAMMA
REDGamma2 REDLogFilm REDGamma3
[REDGamma3]
☐ Enable User Curve

ENABLE USER CURVE

SATURATION 0.00 TO 4.0 [1.000] ◀▶
CONTRAST -1.0 TO 1.0 [0.000] ◀▶
BRIGHTNESS -10.0 TO 10.0 [0.000] ◀▶
FLUT -8.0 TO 8.0 [0.000] ◀▶
EXPOSURE -7.0 TO 7.0 [0.000] ◀▶
SHADOW -2.0 TO 2.0 [0.000] ◀▶

BLACK/TOE/CENTER/KNEE/WHITE X / Y
X = 0.00 TO 1.00 [0.00/0.25/0.50/0.75/1.00] Y = 0.00 TO 1.00 [0.00/0.25/0.50/0.75/1.00]

TOOLS | ZEBRA | OVERLAY | MODES | FRAME GUIDE | AREA GUIDES | MONITOR

SHOW:
☐ AF Zones ☑ Center
☐ Grid Look Around:
TRANSPARANCY % / COLOR:
☑ File Name ☑ Lens Info
☑ Time Code

LCD/EVF BRIGHTNESS
TOUCH GESTURES:
☐ Pinch to Magnify
☐ Double-Click Right 25% to Record
☐ Double-Click Left 25% to Start AF

ZEBRA 1 DISABLED BY DEFAULT ✓ ☐
ZEBRA 2 DISABLED BY DEFAULT ✓ ☐

HIGH IRE 93 TO 109 [108]
LOW IRE 75 TO 107 [99]
HIGH IRE 1 TO 99 [47]
LOW IRE 0 TO 84 [44]

SIZE
OFF 16:9 2.4:1 FULL 1.85:1 USER 4:3 1.9:1
[Full]
Dimensions:

COLOR
WHITE PURPLE BLUE GRAY YELLOW RED TEAL GREEN BLACK
[White]

TRANSPARENCY 0 / 25 / 50 / 75 / 100% [50%]

USER

ASPECT RATIO
OFF 4:3 1.85:1 16:9 2.4:1 USER 14:9
[Off]

COLOR
WHITE PURPLE BLUE GRAY YELLOW RED TEAL GREEN BLACK
[White]

TRANSPARENCY 0 / 25 / 50 / 75 / 100% [50%]

USER SCALE X / Y
X = 0.0% TO 100.0% [80.0%] Y = 0.0% TO 100.0% [80.0%]

LINE STYLE SOLID/DASHED/BRACKET [Bracket]

TITLE GUIDE

ASPECT RATIO
OFF 4:3 1.85:1 16:9 2.4:1 USER 14:9
[Off]

COLOR
WHITE PURPLE BLUE GRAY YELLOW RED TEAL GREEN BLACK
[White]

TRANSPARENCY 0 / 25 / 50 / 75 / 100% [50%]

USER SCALE / OFFSETS X / Y
X = 0.0% TO 100.0% [100.0% / 0.0%] Y = 0.0% TO 100.0% [100.0% / 0.0%]

ACTION GUIDE

ASPECT RATIO
OFF 4:3 1.85:1 16:9 2.4:1 USER 14:9
[Off]

COLOR
WHITE PURPLE BLUE GRAY YELLOW RED TEAL GREEN BLACK
[White]

TRANSPARENCY 0 / 25 / 50 / 75 / 100% [50%]

LINE STYLE SOLID/DASHED/BRACKET [Bracket]

OFF — TOOLS OFF
EXPOSURE
FOCUS
VIDEO
EDGE
RAW
MAGNIFY — TOGGLE MAGNIFY 1:1

EXPOSURE TIME / ANGLE [Time]

SHUTTER MODE ABSOLUTE RELATIVE [Absolute]

APERTURE 1/4 F# / 1/3 F# [1/3 F#]

FOCAL DISTANCE METRIC IMPERIAL [Imperial]

ASPECT RATIO
1.00 TO 10.00 [2.40] +:- 1.00 TO 10.00 [1.00]

SCALE / OFFSETS X / Y
X = 0.0% TO 100.0% [100.0% / 0.0%] Y = 0.0% TO 100.0% [100.0% / 0.0%]

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SHEET 2 OF 4

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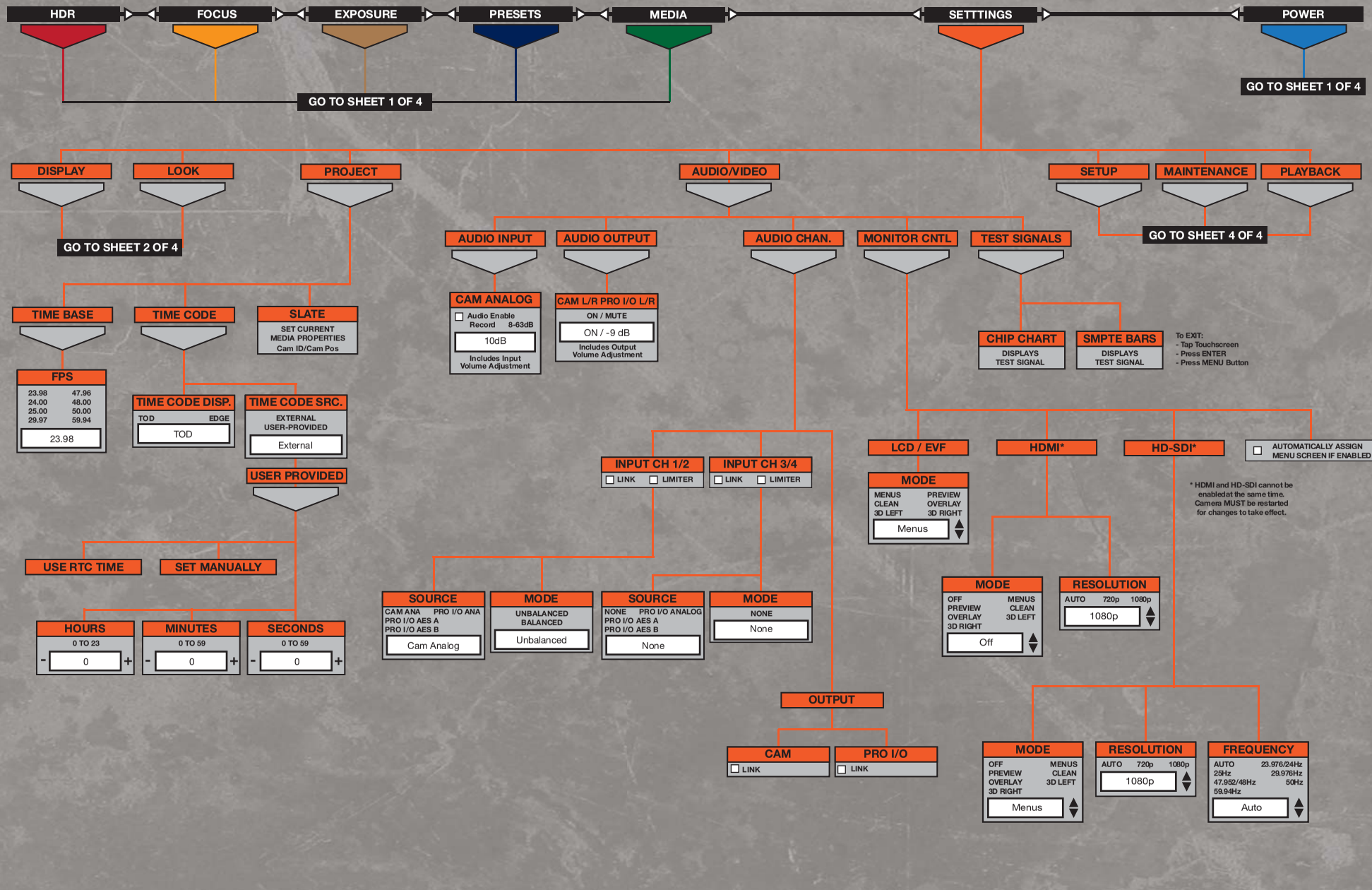

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SHEET 3 OF 4

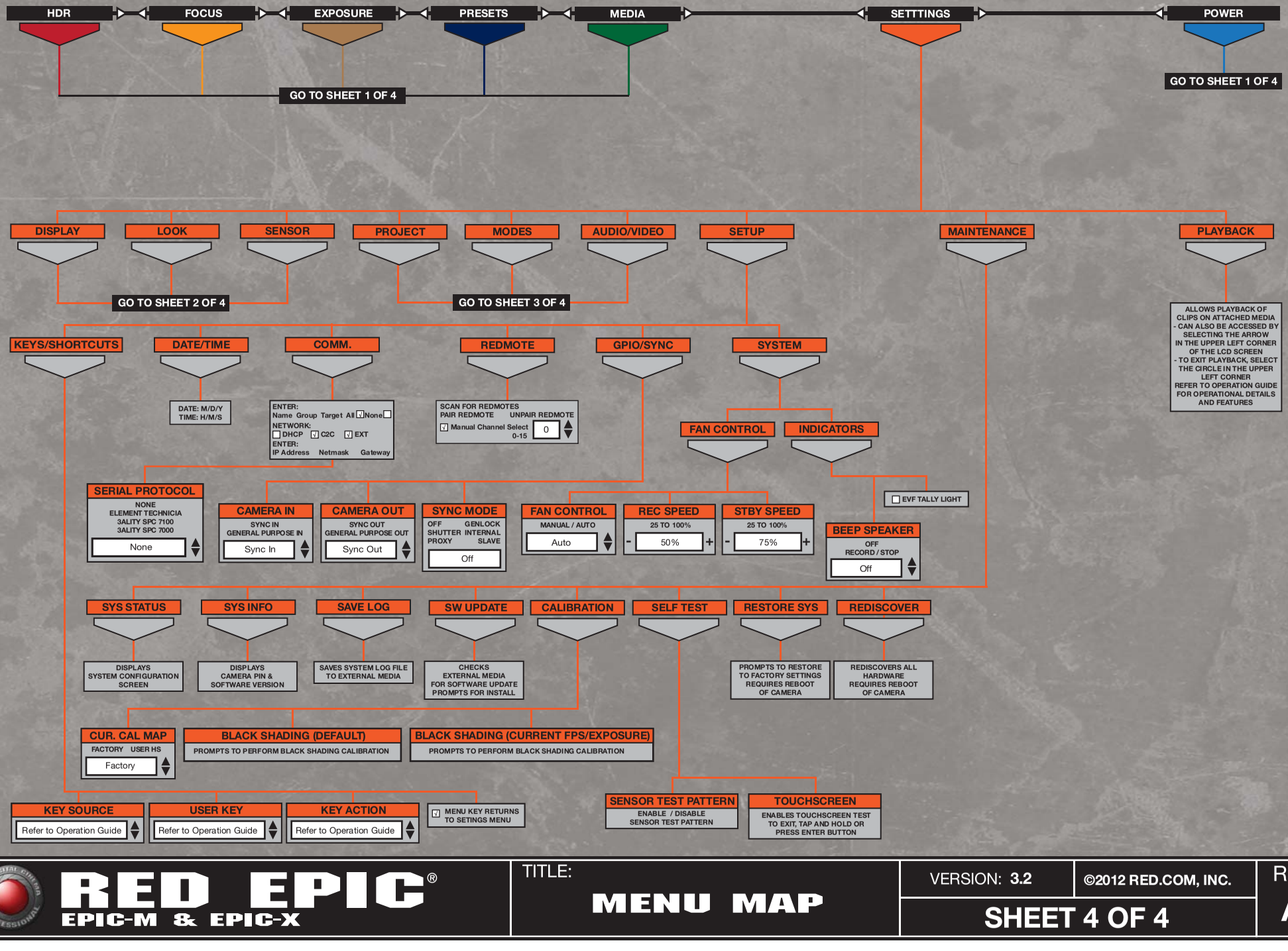
REV A

SECONDARY MENUS

PRESS MENU ICON (LCD) OR MENU BUTTON TO ACCESS

FLOWCHART CONCEPT XL FILMS LTD.

DEFAULT VALUES ARE DISPLAYED IN BOXES



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TITLE:

MENU MAP

VERSION: 3.2

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SHEET 4 OF 4

REV A

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